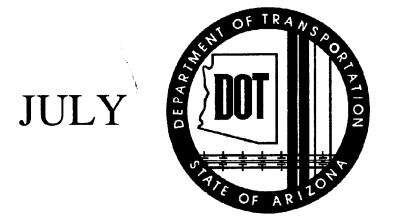
STATE OF ARIZONA

DEPARTMENT OF TRANSPORTATION

CONSTRUCTION



1994

10/95 Also

DIVISION OF HIGHWAYS

STANDARD DRAWINGS

October, 1995

TO: All Users of Construction Standards

FROM: Terry H. Otterness, Design Program Manager, Roadway Engineering Group

SUBJECT: Revisions to Construction Standards - English Version

Several changes are being made to Construction Standard Drawings and the Construction Standards Index.

Most of the changes consist of miscellaneous items found during the final development of the Metric Construction Standards. Generally, the revisions consist of minor corrections and a few major items. These include: revising gutter depression depths, eliminating Type A curb and gutter, clarifying gutter depression versus inlet depression at catch basins, revising reinforcing steel clearances and dimensions, and clarifying manhole frames and covers to match what vendors can supply.

There are two new standards involving concrete half barrier and transition, C-10.62 and C-10.71. Standard C-10.22 has a new second sheet that is a timber post alternate for the freeway guard rail.

One standard has been deleted: C-06.20 - Detour Geometrics.

TO:

All Users of Construction Standards

FROM:

Mr. Terry H. Otterness, Design Program Manager, Roadway Engineering Group

Mr. August V. Hardt, Assistant State Engineer, District Operations Group, Administration

SUBJECT:

Revisions to Construction Standards

Several changes are being made to existing Construction Standard Drawings and the Construction Standards Index.

All Construction Standard Drawings are now converted to CADD. Fifty standards are being reissued without revisions; some have been rearranged. Several other standards are being revised or are new standards.

Major changes include: a reorganization of the C-10 Series, replacing the BCT with a guard rail extruder terminal (GET), which is based on the ET-2000, combining slip form and fixed form for cast in place concrete barrier into one standard with continuous reinforcing, adding a standard for superelevation distribution, adding curb and gutter transitions, consolidating sidewalk details to C-05.20, clarifying contraction joint spacing for curb and gutter and sidewalk, adding a standard for crossroad PCCP joints, spliting C-10.98 and C-10.99 into several new standards based on pay items, adding a new standard for side slope median catch basin, clarifying pipe culvert installation details, detailing storm drain outlet gates, and clarifying median catch basin details.

A complete listing of the revised and new Standards and the various revisions is as follows:

REVISED DRAWING	REVISION
C-02.50 Superelevation Distribution	New standard. A reproduction of the diagrams in Plan No. D-56.40 of the 1986 Roadway Guides.
C-04.10 Spillway, Embankment	Clarified the terminus of the embankment curb to extend 2 feet beyond the guard rail post to decrease erosion around the post.

REVISED DRAWING	REVISION
C-04.20 Downdrain, Embankment	Clarified the terminus of the embankment curb to extend 2 feet beyond the guard rail post to decrease erosion around the post.
C-05.10 Single Curb, Curb & Gutter, Embankment Curb	Added expansion joint detail.
C-05.11 Ramp Curb and Gutter Layout	Separated the entrance ramp layout (sheet 1) from the exit ramp (new sheet 2). Moved the curb and gutter transition to Std C-05.12. Moved sidewalk details to Std C-05.20.
C-05.12 Curb and Gutter Transitions	Changed the transition types from letters (A,B) to numbers (1,2). Added note regarding length of entrance ramp. Revised note 1. Added perspective view for Type 3 transition. Added Type 4 transition from old Std C-05.11. Added Type 5 and Type 6 transitions.
C-05.20 Concrete Driveways and Sidewalks	Revised note 2 regarding referencing the contraction joint detail on sheet 2. Added section B-B for driveways with sidewalk separated from the curb. On sheet 2, added information regarding contraction joint spacing, scoring line spacing and contraction joint details. Revised detail and section for driveway with adjacent sidewalk to provide 3' wide sidewalk with 1% cross slope, as per ADA regulations.
C-05.30 Sidewalk Ramps (sheets 2 & 4 only)	Corrected note 4.
C-06.10 Driveway & Turnout Layouts	Revised the driveways in the plan and section to match the revised driveway standard with the 3 foot wide strip along the back.

REVISED DRAWING	REVISION
C-06.20 Geometrics, Detour	Added note in upper right quadrant to use Detour 'B'. Corrected "typo" from "34' or under" to "34' or wider".
C-07.10 Crossroad PCCP Joints	New standard.
C-08.10 Ramp Geometrics	Revised curve callout to see plans.
C-10.01 Type A Guard Rail Installation	Combined the sections since the only difference is the use of embankment curb. Clarified note and revised drawing regarding guard rail extending beyond the embankment curb. Added a note referring to C-10.03 for measurement limits. Revised reference of BCT to a reference to a generic end treatment. Added a note to see the Standard Specifications for reflector tab spacing.
C-10.02 Type B Guard Rail Installation	Combined the sections since the only difference is the use of embankment curb. Clarified note and revised drawing regarding guard rail extending beyond the embankment curb. Added a note referring to C-10.03 for measurement limits. Revised reference of BCT to a reference to a generic end treatment. Added a note to see Standard Specifications for reflector tab spacing.
C-10.03 Measurement Limits for W Beam System	Rearranged standard into two sheets and added departures. Changed buried anchor to nested W Beam, Std C-10.28. Changed BCT to new GET. Added approach and departure transitions to bridges. Changed measurement of Concrete Half Barrier Transitions from Lin. Ft. to Each. Deleted the median barrier transition. Added departure for thrie beam bridge retrofit.

REVISED DRAWING	REVISION
C-10.06 Half Barrier Terminal w/ Type B or C Curb & Gutter	New standard. Shows installation details for half barrier with a new GET.
C-10.15 Barrier Details at Piers	New standard from old Std C-10.20. Revised to show only installation details with barrier moved to new Std C-10.64.
C-10.20 G4(1W) and G4(2W) Blocked Out W Beam (Timber Post)	New standard from old Std C-10.04. No changes.
C-10.21 G4(1S) and G4(2S) Blocked Out W Beam (Steel Post)	New standard from old Std C-10.05. No changes.
C-10.22 G4(1S-Modified) Blocked Out W Beam (Steel Post) with Special Curb & Gutter	New standard from old Std C-10.06. Added reference to Curb and Gutter in Section. Revised callout for Curb and Gutter. Added note limiting height of curb to 4 inches.
C-10.23 G9(A) and G9(B) Blocked Out Thrie Beam (Steel Post)	New standard from old Std C-10.07. No changes.
C-10.24 G9(C) Blocked Out Thrie Beam (Steel Post)	New standard from old Std C-10.08. No changes.
C-10.28 Nested Steel W Beam Short Span Type 1 and 2 (sheet 1 only)	Moved and revised section A-A to improve understanding that nested rail is additional W Beam to the regular guard rail.
C-10.40 Guard Rail Extruder Terminal GET-1	New standard to be used on non-curb conditions. Includes installation details for use with Type A and B guard rail.
C-10.41 Guard Rail Extruder Terminal GET-2	New standard to be used on curbed conditions. Includes installation details for use with Type A and B guard rail.

REVISED DRAWING	REVISION
C-10.44 Hardware for Guard Rail Extruder Terminal	New standard.
C-10.45 Guardrail Anchor Assembly Steel Terminal Post	New standard from old Std C-10.21. Added note referring to measurement limits on Std C-10.03. Removed references to BCT.
C-10.60 Half Barrier, Cast in Place Slip Form & Fixed Form	New standard from old Std C-10.09. Changed to both slip form and fixed form. Widened base to offset the B joint 2 inches away from the face of the barrier. Added detail for barrier with 2'-6" wide gutter. Revised joint to a type B joint with rebar.
C-10.61 Half Barrier, Precast	New standard from old Std C-10.11. Added General Notes and rebar details.
C-10.64 Half Barrier (At Piers)	New standard from portion of old Std C-10.20. Can be cast-in-place with continuous reinforcing or precast in sections.
C-10.65 Half Barrier with Sidewalk	New standard regarding the "special concrete barrier" from old Std C-10.99.
C-10.66 Median Barrier, Cast in Place Slip Form & Fixed Form	New standard from old Std C-10.12. Changed to both slip form and fixed form.
C-10.68 Median Barrier, Precast	New standard from old Std C-10.14. Added rebar detail.

REVISED DRAWING	REVISION
C-10.75 Barrier Transition-Tangent Departure	New standard from old Std C-10.98. All transitions this standard are for departure condition. Changed Type A to Type 1 and Type B to Type 2. Shortened length of Type 2 from 30' to 20'. Added new Type 3 transition, which is a 20' long transition from half barrier to freeway curb and without sidewalk.
C-10.76 Barrier Transition-Curve	New standard from old Std C-10.99 and shows only the transition. Revised the elevation of the sidewalk to match that of the gutter. Shows limits of the barrier gutter transition.
C-11.10 Roadway Cattle Guard	Added details for the angle assemblies. Incorporated elements from Stds C-11.11 & C-11.12. Deleted note referring to Stds C-11.11 & C-11.12. Added note describing Angle Assembly Detail No. 2.
C-11.20 Cattle Guard, Drainage	Revised note that the transition of the C-04.10 spillway shall be symmetrical about the subgrade/slope hinge point.
C-12.10 Fence, Woven Wire	Added ASTM design numbers to the fence fabric dimensions.
C-13.10 Pipe Culvert Installations	Revised reference in note from C-14.00 to B-11.11 and B-11.14. Revised note 3 so that dimensions W and E are for all conditions. Added note that defines the minimum cover to be 12 inches. Added note and detail that defines pipe berm requirements. Added note that plating of slopes at pipe locations are similar for pipes without end sections and for multiple pipe installations. Revised and expanded table for multiple pipe installations. Moved several details to new sheet 2. Removed two dimensions from the perforated CMP detail. Added a detail and note for multiple end sections.

REVISED DRAWING	REVISION
C-13.15 Typical Pipe Installation	Added new note defining the construction requirements for non-trench condition. Added dimensional note in the non-trench condition detail showing minimum width for pipe stability for trench and non-trench condition.
C-13.60 Slotted Drain Details	Changed welding of bearing bars to pipe to a continuous weld as per Std Specs.
C-13.75 Storm Drain Outlet Details	Added a table showing dimensions for gates for various sizes of pipes. Deleted note with duplicate information shown in the anchor bolt detail. Deleted note to see plans for access barrier gate dimension schedule. Added note to space the barrier bars evenly. Added note on hinge pin material and installation. Added overall width dimension of the hinge. Deleted three notes about the outlet collar that are in Std C-13.80. Deleted drainage outlet detail.
C-13.80 Pipe Collar Details	Revised clear cover dimension in general note 3 from 2" to 3" to match drawings. Added drainage outlet detail from Std C-13.75.
C-15.10 Catch Basin, Type 1	Added location reference point.
C-15.20 Catch Basin, Type 3	Added location reference point.
C-15.30 Catch Basin, Type 4	Added note identifying stove bolts and added location reference point.
C-15.40 Catch Basin, Type 5	Added location reference point.

REVISED DRAWING	REVISION
C-15.70 Catch Basin Miscellaneous Details	Added note indicating maximum gutter depression of 3 inches. Added note regarding distance for full depression along curb. Added note regarding non-use of apron on this standard with C-15.80. Revised length of gutter depression transition from 3 feet minimum to 3 feet.
C-15.75 Catch Basin, Drop Inlet	New standard from old Std C-14.30.
C-15.80 Catch Basin, Median, Flush	Revised the perspective view, concentrating on the apron. Revised back slope of apron on median dike to 10:1. Revised fore slope of apron from 6:1 to match profile of median. Added note to see plans for the grate elevation of the catch basin. Added note that states that the top elevation of the back portion of the apron is controlled by the sides of the apron. Added a median ditch grade detail. Revised the 'H' dimension to reflect the inside catch basin wall height. Added a variable dimension for the back portion of the apron, which reflects the fact that the back slope is fixed at 10:1 and the side slopes are variable. Added note indicating location on catch basin for station referencing.
C-15.81 Catch Basin, Median, Side Slope	New standard for use on narrow medians where the roadways are superelevated.
C-15.90 Catch Basin, Median Dike, Precast	Added location reference point.
C-15.91 Freeway Catch Basin Details	Revised location of location reference point to lip of gutter. Moved frame and grate details to sheet 2.
C-16.40 Irrigation Sleeves	Added note 6 defining material to be used for caps or plugs is to be recommended by pipe supplier and approved by the Engineer.

REVISED DRAWING	REVISION
C-17.10 Bank Protection, Rail Types 1,2,3	Added callouts in perspective view for single and double wrapped wire ties. Modified table, elliminating the embankment slope rate.
C-18.10 Manhole Details	Revised general note 4. Changed from Std C-07.30, which does not exist, to Std C-18.30. Also changed note to reference C-18.30 for other information. Added note to see Std C-18.40 for location reference point. Added note that defines height of manhole.
C-19.10 Ford - Concrete Walls	Changed callout in elevation view from "Upstream" to "Downstream". Added joint detail.
C-22.15 Sanitary Sewer Encasement	Rearranged general note 4.
C-22.20 Pipe Support Across Trenches	Revised rebar in Type B from two bars to one bar.
C-23.30 Valve Box Installation	Moved three notes from sheets 2 and 3 to sheet 1.
C-23.55 Waterline Cut and Plug for 12" Diameter Main and Smaller	Removed note about dry blocks being shimmed.

The following existing Construction Standard Drawings are being deleted

DELETED DRAWINGS

- C-02.40 Pavement Crown, Parabolic (Rev. 1/83)
- C-10.04 G4(1W) and G4(2W) Blocked Out W Beam (Timber Post) (Rev. 7/85)
- C-10.05 G4(1S) and G4(2S) Blocked Out W Beam (Steel Post) (Rev. 7/85)
- C-10.06 G4(1S-Modified) Blocked Out W Beam (Steel Post) with Special Curb and Gutter (Rev. 7/85)
- C-10.07 G9(A) and G9(B) Blocked Out Thrie Beam (Steel Post) (Rev. 7/85)
- C-10.08 G9(C) Blocked Out Thrie Beam (Steel Post) (Rev. 7/85)
- C-10.09 Half Barrier, Cast in Place, Slip Form (Rev. 10/89)
- C-10.10 Half Barrier, Cast in Place, Fixed Form (Rev. 11/83)
- C-10.11 Half Barrier, Precast (Rev. 1/83)
- C-10.12 Median Barrier, Cast in Place, Slip Form (Rev. 1/93)
- C-10.13 Median Barrier, Cast in Place, Fixed Form (Rev. 1/91)
- C-10.14 Median Barrier, Precast (Rev. 1/91)
- C-10.15 Flared Breakaway Cable Terminal Assembly (Timber Post) (Rev. 7/85)
- C-10.16 Flared Breakaway Cable Terminal Assembly (Steel Post) (Rev. 7/85)

- C-10.17 BCT Assembly, Steel (Rev. 3/87)
- C-10.18 BCT Assembly, Timber (Rev. 10/87)
- C-10.19 Guardrail Assembly (Rev. 10/89)
- C-10.20 Barrier Details at Piers (Rev. 10/89)
- C-10.21 Guardrail Anchor Assembly, Steel Terminal Post (Rev. 3/87)
- C-10.22 Guardrail Anchor Assembly, Timber Terminal Post (Rev. 6/86)
- C-10.98 Barrier Transition Tangent (Rev. 10/89)
- C-10.99 Barrier Transition, Curve (Rev. 10/89)
- C-11.11 Roadway Cattle Guard Grill & Grill Clamp Detail (Rev. 1/83)
- C-11.12 Roadway Cattle Guard Footing Type, Misc. Details (Rev. 1/83)
- C-14.30 Headwall, Drop Inlet (Rev. 1/83)

DRAWING NO.	TITLE	DRAWING NO.	TITLE
C-01.10 C-01.11 C-01.12 C-01.13 C-01.30 C-01.31 C-01.31	TITLE SYMBOL LEGEND GENERAL ABBREVIATIONS GENERAL ABBREVIATIONS SCHERAL ABBREVIATIONS SLOPES, INTERSTATE SLOPES, PRIMARY ROADWAYS SUPERS, SECONDARY/MISC ROADWAYS SUPERLEVATION DISTRIBUTION DITCHES, CHANNELS, DIKES AND BERMS (5 SHEETS) SPILLWAY, EMBANKMENT COMMORAIN, EMBANKMENT SPILLWAY, EMBANKMENT DOWNDRAIN, EMBANKMENT SPILLWAY, LENGTH TABLE DOWNDRAIN ENERGY DISSIPATOR SINGLE CURB, CURB & GUTTER EMBANKMENT CURB RAMP CURB & GUTTER TABLE 100WNDRAIN ENERGY DISSIPATOR SINGLE CURB, CURB & GUTTER EMBANKMENT CURB RAMP CURB & GUTTER TRANSITIONS (3 SHEETS) CONCRETE DRIVEWAYS & SIDEWALKS (2 SHEETS) MEDIAN PAVING AND NOSE TRANSITION CONCRETE BUS BAY DRIVEWAY & TURNOUT LAYOUTS (2 SHEETS) PCCP JOINTS (2 SHEETS) LOAD TRANSFER DOWEL ASSEMBLY MAINLINE PCCP JOINT LOCATIONS (8 SHEETS) ENTRANCE RAMP PCCP JOINTS EXIT RAMP PCCP JOINTS	C-10.01 C-10.02 C-10.03 C-10.06 C-10.15 C-10.20 C-10.21	TYPE A GUARD RAIL INSTALLATION, REFLECTOR TAB TYPE B GUARD RAIL INSTALLATION, REFLECTOR TAB MEASUREWENT LIMITS FOR W BEAM AND THRIE BEAM SYSTEM (2 SHEETS) HALF BARRIER TERMINAL W/TYPE B OR C CURB & GUTTER BARRIER DETAILS AT PIERS G4(1W) AND G4(2W) BLOCKED OUT W BEAM (TIMBER POST) G4(1S) AND G4(2S) BLOCKED OUT W BEAM (STEEL POST) G4(1D) AND G5(2D) BLOCKED OUT W BEAM (TIMBER POST) G4(MODIFIED) BLOCKED OUT W BEAM WITH SPECIAL CURB AND GUTTER (2 SHEETS)
C-02.10 C-02.20 C-02.30 C-02.50	SLOPES, INTERSTATE SLOPES, PRIMARY ROADWAYS SLOPES, SECONDARY/MISC ROADWAYS SUPERELEVATION DISTRIBUTION	C-10.23 C-10.24 C-10.28 C-10.29 C-10.30	G9(A) AND G9(B) BLOCKED OUT THRIE BEAM (STEEL POST) G9(C) BLOCKED OUT THRIE BEAM (STEEL POST) NESTED STEEL W BEAM (2 SHEETS) BOLTED ANCHOR GUARD RAIL (2 SHEETS) GUARD RAIL TRANSITION. W BEAM TO CONCRETE HALF BARRIER (APPROACH) (3 SHEETS) GUARD RAIL TRANSITION. W BEAM TO CONCRETE HALF BARRIER (APPROACH) (WITH CHIRD) (3 SHEETS)
C-03.10 C-04.10 C-04.20 C-04.30 C-04.40 C-04.50	SPILLWAY, EMBANKMENT COWNDRAIN, EMBANKMENT SPILLWAY LENGTH TABLE UDWNDRAIN LENGTH TABLE UDWNDRAIN LENGTH TABLE DOWNDRAIN ENERGY DISSIPATOR	C-10.32 C-10.39 C-10.40 C-10.41 C-10.44 C-10.45	GUARD RAIL TRANSITION, W BEAM TO CONCRETE HALF BARRIER (DEPARTURE) (3 SHEETS) HARDWARE FOR W BEAM TRANSITION TO CONCRETE BARRIER GUARD RAIL EXTRUDER TERMINAL, GET-1 (2 SHEETS) GUARD RAIL EXTRUDER TERMINAL, GET-2 (2 SHEETS) HARDWARE FOR GUARD RAIL EXTRUDER TERMINAL (3 SHEETS) GUARD RAIL ANCHOR ASSEMBLY STEEL TERMINAL (3 SHEETS) GUARD RAIL ANCHOR ASSEMBLY STEEL TERMINAL (3 SHEETS) HALF BARRIER, CAST IN PLACE, SLIP FORM & FIXED FORM
C-05.10 C-05.11 C-05.12 C-05.20 C-05.30 C-05.40 C-05.50	SINGLE CURB, CURB & GUTTER EMBANKMENT CURB RAMP CURB & GUTTER LAYOUT (2 SHEETS) CURB & CUTTER TRANSITIONS (3 SHEETS) CONCRETE DRIVEWAYS & SIDEWALKS (2 SHEETS) SIDEWALK RAMP (4 SHEETS) MEDIAN PAVING AND NOSE TRANSITION CONCRETE BUS BAY	C-10. 61 C-10. 62 C-10. 62 C-10. 64 C-10. 66 C-10. 68 C-10. 70	HALF BARRIER, PRECASI CONCRETE HALF BARRIER WITH GUTTER HALF BARRIER (AT PIERS) (2 SHEETS) HALF BARRIER WITH SIDEWALK MEDIAN BARRIER, CAST IN PLACE, SLIP FORM & FIXED FORM MEDIAN BARRIER, PRECAST CONNERTE HAIF BARRIER TRANSITION (4 SHEETS)
C-06.10 C-07.01 C-07.02 C-07.03	DRIVEWAY & TURNOUT LAYOUTS (2 SHEETS) PCCP JOINTS (2 SHEETS) LOAD TRANSFER DOWEL ASSEMBLY MAINLINE PCCP JOINT LOCATIONS (8 SHEETS)	C-10.71 C-10.74 C-10.75 C-10.76 C-10.80 C-10.83	CONCRETE HALF BARRIER TRANSITION (3 SHEETS) HARDWARE FOR CONCRETE BARRIER TRANSITIONS BARRIER TRANSITION-TANGENT-DEPARTURE TYPES 1, 2, AND 3 (3 SHEETS) BARRIER TRANSITION-CURVE RUB RAIL (2 SHEETS) HARDWARE FOR RUB RAIL GLARE SCREEN, CONCRETE MEDIAN BARRIER (3 SHEETS)
C-07.04 C-07.05 C-07.06 C-07.10	CROSSROAD PCCP JOINTS	C-11.10 C-11.20 C-11.30	ROADWAY CATTLE GUARD (3 SHEETS) CATTLE GUARD, DRAINAGE CATTLE GUARD, RAILROAD
C-C8.10 C-08.20 C-09.10	RAMP GEOMETRICS PAVED GORE AREA GROOVING FOR BITUMINOUS SHOULDERS	C-12.10 C-12.20 C-12.30	FENCE, WOVEN AND BARBED WIRE WITH GATES (5 SHEETS) FENCE, CHAIN LINK TYPES I AND 2 WITH GATES (3 SHEETS) CHAIN LINK CABLE BARRIER (3 SHEETS)

DRAWING NO.	TITLE	DRAWING NO.	TITLE
C-01.10 C-01.11 C-01.12 C-01.13 C-01.30 C-01.31 C-01.32	SYMBOL LEGEND GENERAL ABBREVIATIONS GENERAL ABBREVIATIONS GENERAL ABBREVIATIONS SLOPES. INTERSTATE SLOPES. PR MARY ROADWAYS SUPERS. SECONDARY/MISC ROADWAYS SUPERELEVATION DISTRIBUTION DITCHES. CHANNELS. DIKES AND BERMS (5 SHEETS) SPILLWAY, EMBANKMENT UDWNDRAIN. EMBANKMENT SPILLWAY, EMBANKMENT COMNORAIN. EMBANKMENT LENGTH TABLE DOWNDRAIN. EMBANKMENT LENGTH TABLE CONNORTED SINGLE CURB. CURB & GUTTER EMBANKMENT CURB RAMP CURB & GUTTER LAYOUT (2 SHEETS) CCONCRETE DRIVEWAYS & SIDEWALKS (2 SHEETS) SIDEWALK RAMP (4 SHEETS) MEDIAN PAVING AND NOSE TRANSITION CONCRETE DRIVEWAYS & SIDEWALKS (2 SHEETS) SIDEWALK RAMP (4 SHEETS) MEDIAN PAVING AND NOSE TRANSITION CONCRETE BUS BAY DRIVEWAY & TURNOJT LAYOUTS (2 SHEETS) COMMETTICS, DETOUR PCCP JOINTS (2 SHEETS) LOAD TRANSFER DOWEL ASSEMBLY MAINLINE PCCP JOINTS EXIT RAMP PCCP JOINTS EXIT RAMP PCCP JOINTS TRENCH BACKFILL AND PAVEMENT REPLACEMENT CROSSROAD PCCP JOINTS EXAMP GEOMETRICS PAVED GORE AREA CROONLING FOR ALTHAUNCHS SHOULDERS	C-10.01 C-10.02 C-10.03 C-10.06 C-10.15 C-10.20 C-10.21	TYPE A GUARD RA!L INSTALLATION, REFLECTOR TAB TYPE B GUARD RA!L INSTALLATION, REFLECTOR TAB TYPE B GUARD RA!L INSTALLATION, REFLECTOR TAB MEASUREMENT LIMITS FOR W BEAM AND THRIE BEAM SYSTEM (2 SHEETS) HALF BARRIER TERMINAL W/TYPE B OR C CURB & GUTTER BARRIER DETAILS AT PIERS G41 [W) AND G4(2W) BLOCKED OUT W BEAM (TIMBER POST) G41 [S) AND G4(2S) BLOCKED OUT W BEAM (STEEL POST) G41 [S-MODIFIED) BLOCKED OUT W BEAM (STEEL POST) G41 [S-MODIFIED) BLOCKED OUT W BEAM (STEEL POST) G41 [S-MODIFIED) BLOCKED OUT THRIE BEAM (STEEL POST)
C-02.10 C-02.20 C-02.30 C-02.50	SLOPES, INTERSTATE SLOPES, PRIMARY ROADWAYS SLOPES, SECONDARY/MISC ROADWAYS SUPERELEVATION DISTRIBUTION	C-10.23 C-10.24 C-10.28 C-10.29 C-10.30	G9(C) BLOCKED DUI HERTE BEAM (STEEL POST) NESTED STEEL W BEAM (2 SHEETS) BOLLED ANDHOR GUARD RAIL (2 SHEETS)
C-03.10	DITCHES, CHANNELS, DIKES AND BERMS (5 SHEETS)	C-10.31 C-10.32	GUARD RAIL TRANSITION, W BEAM TO CONCRETE HALF BARRIER (APPROACH) (3 SHEETS) GUARD RAIL TRANSITION, W BEAM TO CONCRETE HALF BARRIER (APPROACH) (WITH CURB) (3 SHEETS) GUARD RAIL TRANSITION, W BEAM TO CONCRETE HALF BARRIER (DEPARTURE) (3 SHEETS)
C-04.10 C-04.20 C-04.30 C-04.10 C-04.50	SPILLWAY, EMBANKMENT UOWNDRAIN, EMBANKMENT SPILLWAY, EMBANKMENT LENGTH "ABLE DOWNDRAIN, EMBANKMENT LENGTH TABLE DOWNDRAIN, EMBANKMENT LENGTH TABLE DOWNDRAIN ENERGY DISSIPATOR	C-10.39 C-10.40 C-10.41 C-10.44 C-10.45	HARDWARE FOR W BEAM TRANSITION TO CONCRETE BARRIER GUARD RAIL EXTRUDER TERMINAL, GET-1 (2 SHEETS) GUARD RAIL EXTRUDER TERMINAL, GET-2 (2 SHEETS) HARDWARE FOR GUARD RAIL EXTRUDER TERMINAL (3 SHEETS) GUARD RAIL ANCHOR ASSEMBLY STEEL TERMINAL POST HALF BARRIER, CAST IN PLACE, SLIP FORM & FIXED FORM
C-05.10 C-05.11 C-05.12 C-05.20 C-05.30 C-05.40 C-05.50	SINGLE CURB, CURB & GUTTER EMBANKMENT CURB RAMP CURB & GUTTER LAYOUT (2 SHEETS) CLRB & GUTTER TRANSITIONS (3 SHEETS) CONCRETE DRIVEWAYS & SIDEWALKS (2 SHEETS) SIDEWALK RAMP (4 SHEETS) MEDIAN PAVING AND NOSE TRANSITION CONCRETE BUS BAY	C-10. 60 C-10. 61 C-10. 65 C-10. 66 C-10. 70 C-10. 74	HALF BARRIER, PRECAST HALF BARRIER (AT PIERS) (2 SHEETS) HALF BARRIER WITH SIDEWALK MEDIAN BARRIER, CAST IN PLACE, SLIP FORM & FIXED FORM MEDIAN BARRIER, PRECAST CONCRETE HALF BARRIER TRANSITION (4 SHEETS) HARDWARE FOR CONCRETE BARRIER TRANSITIONS BARRIER TRANSITION-TAVOENT-DEPARTURE TYPES 1, 2, AND 3 (3 SHEETS)
C-06.10 C-06.20	DRIVEWAY & TURNOUT LAYOUTS (2 SHEETS) GEOMETRICS, DETOUR	C-10.76 C-10.80 C-10.83 C-10.97	BARRIER TRANSITION-CURVE RUB RAIL (2 SHEETS) HARDWARE FOR RUB RAIL GLARE SCREEN, CONCRETE MEDIAN BARRIER (3 SHEETS)
C-07.01 C-07.02 C-07.03 C-07.04 C-07.05	LOAD TRANSFER DOWEL ASSEMBLY MAINLINE PCCP JOINT LOCATIONS (8 SHEETS) ENTRANCE RAMP PCCP JOINTS EXIT RAMP PCCP JOINTS	C-11.10 C-11.20 C-11.30	ROADWAY CATTLE GUARD (3 SHEETS) CATTLE GUARD, DRAINAGE CATTLE GUARD, RAILROAD
C-07.06 C-07.10 C-08.10	TRENCH BACKFILL AND PAVEMENT REPLACEMENT CROSSROAD PCCP JOINTS RAMP GEOMETRICS	C-12.10 C-12.20 C-12.30	FENCE, WOVEN AND BARBED WIRE WITH CATES (5 SHEETS) FFNCF, CHAIN LINK 1YPES 1 AND 2 WITH GATES (3 SHEETS) CHAIN LINK CABLE BARRIER (3 SHEETS)
C-08.20 C-09.10	PAVED GORE AREA GROOVING FOR BITUMINOUS SHOULDERS		

DRAWING NO.	TITLE	DRAWING NO.	TITLE
C-13.10 C-13.15 C-13.20 C-13.25	PIPE CULVERT INSTALLATION (2 SHEETS) TYPICAL PIPE INSTALLATION PIPE, REINFORCED CONCRETE END SECTION PIPE, CORRUGATED METAL, END SECTION	C-18.10 C-18.20 C-18.30 C-18.40	MANHOLE DETAILS MANHOLE FRAME & COVER DETAILS MISCELLANEOUS MANHOLE DETAILS MANHOLE RISER DETAILS
C-13.30 C-13.55 C-13.60	PIPE & PIPE ARCH, CORRUGATED METAL CONCRETE INVERT PAVING PIPE, CATTLE-VEHICLE PASS, MITERED END TREATMENT SLOTTED DRAIN DETAILS	C-19.10 C-19.20	FORD - CONCRETE WALLS FORDS - TYPES 1 & 2
C-13.65 C-13.70 C-13.75	SLÖTTÉD DRAIN INSTALLATION DETAILS STORM DRAIN CONNECTION DETAILS STORM DRAIN OUTLET DETAILS (2 SHEETS)	C-21.10 C-21.20	SURVEY MONUMENT, FRAME AND COVER, RIGHT OF WAY MARKER STANDARD MARKER
C-13. 80 C-15. 10 C-15. 20 C-15. 30 C-15. 40 C-15. 50 C-15. 60 C-15. 75 C-15. 81 C-15. 90 C-15. 91 C-16. 20 C-16. 30 C-16. 30 C-16. 40	PIPE, PIPE ARCH, CORRUGATED METAL CONCRETE INVERT PAVING PIPE, CATTLE-VEHICLE PASS, MITERED END TREATMENT SLOTTED DRAIN DETAILS SLOTTED DRAIN INSTALLATION DETAILS STORM DRAIN CONNECTION DETAILS STORM DRAIN CONNECTION DETAILS STORM DRAIN CONNECTION DETAILS (2 SHEETS) PIPE COLLAR DETAILS CATCH BASIN, TYPE 1 CATCH BASIN, TYPE 3 CATCH BASIN, TYPE 4 CATCH BASIN, TYPE 5 CATCH BASIN, TYPE 5 CATCH BASIN, TYPE 5 CATCH BASIN, GRATES, LONGITUDINAL BARS CATCH BASIN, GRATES, TRANSVERSE BARS CATCH BASIN, GRATES, TRANSVERSE BARS CATCH BASIN, MEDIAN FLUSH CATCH BASIN, MEDIAN FLUSH CATCH BASIN, MEDIAN FLUSH CATCH BASIN, MEDIAN FLUSH FLUSH CATCH BASIN, MEDIAN FLUSH FREEWAY CATCH BASIN DETAILS (2 SHEETS) SPECIAL CATCH BASIN WITH HALF BARRIER IRRIGATION HEADWALLS 18* TO 60° DIAMETER PIPES IRRIGATION STANDPIPES IRRIGATION	C-22.10 C-22.20 C-22.25 C-22.35 C-22.35 C-22.36 C-23.15 C-23.20 C-23.20 C-23.30 C-23.30 C-23.36 C-23.40 C-23.45 C-23.45 C-23.45 C-23.55 C-23.65	UTILITY LINE, PROTECTIVE CONCRETE SLAB SANITARY SEWER ENCASEMENT PIPE SUPPORT ACROSS TRENCHES (3 SHEETS) PRECAST SANITARY SEWER MANHOLES STUB OUT AND PLUG DROP SEWER CONNECTIONS SEWER CLEANOUT THRUST BLOCKS FOR WATER LINES BLOCKING FOR WATER LINES BLOCKING FOR WATER VALVES GATE AND BUTTERFLY ANCHOR BLOCK FOR VERTICAL BENDS VERTICAL REALIGNMENT FOR WATER MAINS VALVE BOX INSTALLATION (2 SHEETS) TAPPING SLEEVE AND VALVE INSTALLATION JOINT RESTRAINT WITH TIE RODS CONCRETE WATER METER BOX STEEL COVER FOR WATER METER BOX WATERLINE-CUT AND PLUG 12 DIA, MAIN AND SMALLER HTDRANT INSTALLATION (5 PIRE HYDRANT INSTALLATION) FIRE HYDRANT LOCATIONS
C-11.10 C-17.20	BANK PROTECTION, RAIL TYPES 1, 2 & 3 BANK PROTECTION. RAIL TYPES 4, 5 & 6		

DRAWING NO.	TITLE	DRAWING NO.	TITLE
C-13.10 C-13.15 C-13.20 C-13.25	PIPE CULVERT INSTALLATION (2 SHEETS) TYPICAL PIPE INSTALLATION PIPE, REINFORCED CONCRETE END SECTION PIPE, CORRUGATED METAL, END SECTION	C-18.10 C-18.20 C-18.30 C-18.40	MANHOLE DETAILS MANHOLE FRAME & COVER DETAILS MISCELLANEOUS MANHOLE DETAILS MANHOLE RISER DETAILS
C-13.30 C-13.55 C-13.60	PIPE & PIPE ARCH, CORRUCATED METAL CONCRETE INVERT PAVING PIPE, CATTLE-VEHICLE PASS, MITERED END TREATMENT SLOTTED DRAIN DETAILS	C-19.10 C-19.20	FORD - CONCRETE WALLS FORDS - TYPES 1 & 2
C-13.65	SLOTTED DRAIN INSTALLATION DETAILS	C-21.10 C-21.20	SURVEY MONUMENT, FRAME AND COVER, RIGHT OF WAY MARKER STANDARD MARKER
C-13.80 C-15.10 C-15.20 C-15.40 C-15.60 C-15.60 C-15.70 C-15.75	STORM DRAIN QUILET DETAILS (2 SHEETS) PIPE COLLAR DETAILS CATCH BASIN, TYPE 1 CATCH BASIN, TYPE 3 CATCH BASIN, TYPE 4 CATCH BASIN, GRATES, LONGITJDINAL BARS CATCH BASIN, GRATES, TRANSVERSE BARS CATCH BASIN, GRATES, TRANSVERSE BARS CATCH BASIN, MISC. DETAILS CATCH BASIN, MEDIAN FLUSH CATCH BASIN, MEDIAN FLUSH CATCH BASIN, MEDIAN FLUSH CATCH BASIN, MEDIAN SIDE SLOPE CATCH BASIN, MEDIAN DITAILS (2 SHEETS) SPECIAL CATCH BASIN WITH HALF BARRIER IRRIGATION STANDPIPES IRRIGATION STANDPIPES IRRIGATION VALVE & GATE IRRIGATION VALVE & GATE IRRIGATION SLEEVES BANK PROTECTION, RALL TYPES 1, 2 & 3	C-22.10 C-22.15 C-22.20 C-22.25 C-22.30 C-22.35 C-22.40	UTILITY LINE, PROTECTIVE CONCRETE SLAB SANITARY SEWER ENCASEMENT PIPE SUPPORT ACROSS TRENCHES (3 SHEETS) PRECAST SANITARY SEWER NANHOLES STUB OUT AND PLUG DROP SEWER CONNECTIONS SEWER CLEANOUT THRUST BLOCKS FOR WATER LINES BLOCK ING FOR WATER VALVES GATE AND BUTTERFLY
0-15.80 0-15.81 0-15.90 0-15.91 0-15.92	CATCH BASIN, MEDIAN, SIDE SLOPE CATCH BASIN, MEDIAN, DIES SLOPE CATCH BASIN, MEDIAN DIKE, PRECAST FREEWAY CATCH BASIN DETAILS (2 SHEETS) SPECIAL CATCH BASIN WITH HALF BARRIER	C-23.2C C-23.25 C-23.30 C-23.35 C-23.40	ANCHOR BLOCK FOR VERTICAL BENDS VERTICAL REALICHMENT FOR WATER MAINS VALVE BOX INSTALLATION (2 SHEETS) TAPPING SLEEVE AND VALVE INSTALLATION JOINT RESTRAINT WITH TIE RODS
C-16.10 C 16.20 C-16.30 C-16.40	IRRIGATION HEADWALLS 18° TO 60° DIAMETER PIPES IRRIGATION STANDPIPES IRRIGATION VALVE & GATE IRRIGATION SLEEVES	C-23.45 C-23.50 C-23.55 C-23.60 C-23.65	CONCRETE WATER METER BOX STEEL COVER FOR WATER METER BOX WATERLINE-CUT AND PLUG 12° DIA. MAIN AND SMALLER HYDRANT INSTALLATION FIRE HYDRANT LOCATIONS
C-17.10 C-17.20	BANK PROTECTION, RAIL TYPES 1, 2 & 3 BANK PROTECTION, RAIL TYPES 4, 5 & 6		

	CONSTRUCTION	DRAWING SYMBOLS		CONSTRUCTION D	RAWING SYMBOLS
	NEW FEATURES	EXISTING FEATURES		NEW FEATURES	EXISTING FEATURES
City Limits			Section Corner		-
County Line			Survey Control Point		
Forest or Reservation Boundry			Bench Wark		.*î.
Property Line			Access Control	ореня опеннични	1 10 1 - 131411 - 1 - 1
Mid Section or Quarter Section Line			Sidewalk, Curb & Gutter w/Depressed Curb (1*=50' or larger)	30, DC	======================================
Right of Way Line			Curb & Gutter with Depressed Curb (1*=100')	+52	
Section Line			Curb, Single with Depressed Area		
Sixteenth Line			Pavement and Sidewalk Edge		
National, State Boundry			Turnout	R	
Township or Range Line			Top of Cut	cc	
Temporary Construction Easement		-	Toe of FIII	FF	
Mile Post Narker	▲ MP	△ MP	Transition, Cut to Fill		
Right of Way Marker	•		Railroad Track (1*=50° or larger)		
Survey Monument	+	()	Railroad Track (1*=100')		
Angle Point or PI	\wedge		Bank Protection	XXXXXXXXXXX	XXXXXXXXXX
Centerilne, Station Marks			Bridge		
Quarter Corner		→	Building	Floor Elevation	Foor Flevation 1984.68

Straight Haw w/End Sct. Pipe (1*20) (All Dia) Straight Haw w/End Sct. Pipe (1*50) or smaller) "U' Haw w/End Sct. Pipe (1*50) or smaller)	atch Basin, Median Dike			Straight Hdwl w/End Sct, Pipe (l*=50' or smaller) (Dia=42* and larger)	NEW FEATURES	EXISTING FEATURE
Straight Havi w/End Sct. Pipe (1-50° or snailer) Straight Havi w/End Sct. Pipe (1-50° or snailer) Straight Havi w/End Sct. Pipe (1-20°) (All Dial	atch Basin, Median Dike			Straight Hdwl w/End Sct, Pipe (l*=50' or smaller) (Dia=42* and larger)		}
Straight Hawl w/End Sct, Pipe (1°50 or smaller) 10 Hawl w/End Sct, Pipe (1°50 or smaller) 11 Hawl w/End Sct, Pipe (1°50 or smaller) 12 Hawl w/End Sct, Pipe (1°50 or smaller) 13 Hawl w/End Sct, Pipe (1°50 or smaller) 14 Hawl w/End Sct, Pipe (1°50 or smaller) 15 Hawl w/End Sct, Pipe (1°50 or smaller) 16 Hawl w/End Sct, Pipe (1°50 or smaller) 17 Hawl w/End Sct, Pipe (1°50 or smaller) 18 Hawl w/End Sct, Pipe (1°50 or smaller) 19 Hawl w/End Sct, Pipe (1°50 or smaller) 10 Hawl w/End Sct, Pipe (1°50 or smaller) 10 Hawl w/End Sct, Pipe (1°50 or smaller) 11 Hawl w/End Sct, Pipe (1°50 or smaller) 12 Hawl w/End Sct, Pipe (1°50 or smaller) 13 Hawl w/End Sct, Pipe (1°50 or smaller) 14 Hawl w/End Sct, Pipe (1°50 or smaller) 15 Hawl w/End Sct, Pipe (1°50 or smaller) 16 Hawl w/End Sct, Pipe (1°50 or smaller) 17 Hawl w/End Sct, Pipe (1°50 or smaller) 18 Hawl w/End Sct, Pipe (1°50 or smaller) 19 Hawl w/End Sct, Pipe (1°50 or smaller) 19 Hawl w/End Sct, Pipe (1°50 or smaller) 10 Hawl w/End Sct, Pipe (1°50 or smaller) 11 Hawl w/End Sct, Pipe (1°50 or smaller) 12 Hawl w/End Sct, Pipe (1°50 or smaller) 13 Hawl w/End Sct, Pipe (1°50 or smaller) 14 Hawl w/End Sct, Pipe (1°50 or smaller) 15 Hawl w/End Sct, Pipe (1°50 or smaller) 16 Hawl w/End Sct, Pipe (1°50 or smaller) 17 Hawl w/End Sct, Pipe (1°50 or smaller) 18 Hawl w/End Sct, Pipe (1°50 or smaller) 19 Hawl w/End Sct, Pipe (1°50 or smaller) 19 Hawl w/End Sct, Pipe (1°50 or smaller) 19 Hawl w/End Sct, Pipe (1°50 or smaller) 10 Hawl w/End Sct,	atch Basin, Off Roadway, Flush				├	3
### 100 ### 10	tch Basin, Single Curb			Straight Hdwl w/End Sct, Pipe ($1^*=50^\circ$ or smaller) ($D(a=36^\circ$ and smaller)	—	
### ### ##############################	•		=======================================			T '
U' Hdwi w/End Sct, Pipe (1'=20' or smaller)	ttle Guard	<u></u>	1	"U" Hdwl w/End Sct, Pipe (1"=20") (All Dia)]=====	6.55
Wing How w/End Sct, Pipe (1*20) (All Dia) we way wing How w/End Sct, Pipe (1*50' or smaller) ""How w/End Sct, Pipe (1*20) (All Dia) ""How w/End Sct, Pipe (1*20) (All Dia) ""How w/End Sct, Pipe (1*50' or smaller) ""How w/End S				"U" Hdwl w/End Sct, Pipe (I'=50' or smaller) (Dia=42' and larger)]======================================	6.00 6.00
Wing Hdwi w/End Sct, Pipe (1*50' or smaller) "L' Hdwi w/End Sct, Pipe (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20) (1*50' or smaller)	oncrete Box Culvert			"U' Hdwl w/End Sct, Pipe (l'=50' or smaller) (Dia=36" and smaller):]	
wing How w/End Sct, Pipe (1'=50' or smaller) "L' How w/End Sct, Pipe (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller) Pipe Ext W/End Sct & Berm (1'=20) (1'=50' or smaller)	ke, Median			Wing Hdwl w/End Sct, Pipe (1°=20') (All Dia))——	
powndrain, two way "L' Hadwi w/End Sct, Pipe (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20') (Ali Dia) Pipe Ext W/End Sct & Berm (1*20') (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20') (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20') (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20') (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20') (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20') (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20') (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20') (1*50' or smaller)	ke			Wing Hdwl w/End Sct. Pipe (1'-50' or smaller) (Dia=42" and larger))——	J
The How we way the weak of the pipe (1°=20°) (All Dia) the How we way the hole of the hole	owndrain, one way	35 EX		Wing Hdwl w/End Sct, Pipe (i'=50' or smaller) (Dia=36" and smaller))——)
*L' Hdwl w/End Sct, Pipe (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller) *Pipe Ext W/End Sct & Berm (1'=20') (1'=50' or smaller)	owndrain, two way			"L" Hdwl w/End Sct, Pipe (1"=20") (All Dia)	1	
Adanhole, Frame & Cover, Reset Pipe Ext W/End Sct & Berm (1*=20') (All Dia) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller) Pipe Ext W/End Sct & Berm (1*=20') (I] = 50' or smaller)		\$ \frac{1}{8} \fra		'L' Hdwl w/End Sc+, Pipe (l'=50' or smaller) 'L' Hdwl w/End Sc+, Pipe (Dia=42' and larger)		
Pipe Ext W/End Sct & Berm (1*20*) (All Dia) Pipe Ext W/End Sct & Berm (1*20*) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20*) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20*) (1*50' or smaller) Pipe Ext W/End Sct & Berm (1*20*) (1*250' or smaller) Pipe Ext W/End Sct & Berm (1*20*) (1*20*) Pipe Ext W/End Sct Roadway Widening (1*20*)	anhole		0	'L' Hdwl w/End Sct, Plpe (Dia=36° and smaller)	7	
Pipe Ext W/End Sct & Berm ((*=20*) (1*=50* or smaller) Pipe Ext W/End Sct & Berm ((*=20*) (1*=50* or smaller) Pipe Ext W/End Sct & Berm ((*=20*) (1*=50* or smaller) Pipe Ext W/End Sct & Berm ((*=20*) (1*=50* or smaller) Pipe Ext W/End Sct & Berm ((*=20*) (1*=50* or smaller) Pipe Ext W/End Sct & Berm ((*=20*) (1*=50* or smaller) Pipe Ext W/End Sct & Berm ((*=20*) (1*=20*) (1*=20*)	anhole, Frame & Cover, Reset			Pipe Ext W/End Sct & Berm (1*=20') (All Dia)		
piliway, one way Pipe Ext W/End Sct & Berm (1*=20*) (1*=50* or smaller) Pipe Ext W/End Sct & Berm (1*=20*) (1*=20*) Pipe Ext W/End Sct Roadway Widening (1*=20*)	etaining Wall					
Pipe Ext W/End Sct & Berm ([*=20") ([*=50" or smaller) (Dia=36" and smaller) Pipe Ext W/End Sct & Berm ([*=20") (Dia=36" and smaller) Pipe Ext W/End Sct Roadway Widening ([*=20")	ock Riprap	\$ # \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	50 50 3	Pipe Ext W/End Sct & Berm ($ ^{+}=20$) ($ ^{+}=50$) or smaller) (Dia=42° and larger)		
ipiliway, two way Pipe Ext W/End Sct Roadway Widening (I*=20')	one way			Pipe Ext W/End Sct & Berm (!*=20")(!T=50" or smaller) (Dla=36" and smaller)		
Dillway, TWO Way		35.		Pipe Ext W/End Sct Roadway Widening (I*=20')	<u></u>	
STATE OF ARIZONA PROVED STATE OF ARIZONA PER	pillway, two way	35.			4	

90 WEST TO REAL TO COMPLETE OF TELESCOPE TEMBERS. PM 10/75					
<u> </u>	CONSTRUCTION D	RAWING SYMBOLS		CONSTRUCTION [RAWING SYMBOLS
	NEW FEATURES	EXISTING FEATURES		NEW FEATURES	EXISTING FEATURES
Plan View, Bituminous Pavement			Irrigation Ditch, Concrete	≡IR ====================================	= IR ==================================
Plan View, Concrete Pavement			Irrigation Ditch, Earth	_R	=iR===================================
Plan View, Graded Surface			Irrigation Line (1°=20°)	=RR	= R
Plan View, Obliterate Pavement			Irrigation Line (1°=100°)	-iR	-IR
Plan View, Wood	572272		Overhead Power/Joint Use Line	-0P	-0f
Section, Asphaltic Concrete Friction Course			Overhead Telephone Line	-OT	- T 0
Section, Bituminous Pavement			Sanitary Sewer (I'=20')	=S S	=S
Section, Concrete	Z		Sanitary Sewer (1°=100°)	s——s——s	-ss
Section, Metal			Storm Drain (*=20") & (*=50")		= 50 24 · 50 <u></u>
Section, Wood			Storm Drain (1°=100°)		-50 <u>- 36.</u> 50 — —
Section, Aggregate Base			Street Light and With Mast Arm	¤ o−¤). Levely
Section, Ground Line	energy everyon	SURVERY	Telephone/Power Pedestal	■T ■P	T DP
Ground Line Profile			Utility Pole with Down Guy and Anchor	• • •	→ • →
Barbed Wire Fence & Gate		**-**	Underground Power/Joint Use Line	- Р	_p
Chain Link Fence & Gate			Underground Telephone Line	_r	
Guard Rail & Breakaw zy Cable Terminal	0	Ga a a a a a a a a a	Water/Gas Meter Box	₩M GM	WW GM
① Cuard Rall & Cuard Rall Extruder Terminal	>	D 	Water/Cas Valve	WV GV	₩V 6V
Cas Line	-c	- c	Lear H.C. Weekly to Co. Although the Co. Alth	DEDIGHT OF T	ANSPORTATION 10/95
			Roundley A	lions SYMBOL LEGE	ND C-01.12

NEW FEATURES NEW FEATURES EXISTING FEATURES		CONSTRUCTION D	RAWING SYMBOLS		CONSTRUCTION	DRAWING SYMBOLS
And Year, Concrete Pavement. And Year, Ye					NEW FEATURES	EXISTING FEATURE
Plan View, Chacked Surface Irrigation Line (1120)	Plan View, Bituminous Pavement			Irrigation Ditch, Concrete	=IR ==== IR	■ .H =
Plant View, Graded Surface Prigotion Line (I*100)	Plan View, Concrete Pavement			Irrigation Ditch. Earth	=R=====R	= IR IR
Nem View, Wood Section, Asphaltic Concrete Friction Course Section, Bituminous Pavement Section, Bituminous Pavement Section, Concrete Section, Metal Section, Metal Section, Wood Section, Aggregate Base Section, Aggregate Base Section, More Profile Unility Poe virth Dawn Guy and Anchor Unility Poe virth Dawn Guy and Anchor Unicarground Power/Joint Use Line Uncarground Power/Joint Use Line Uncarground Power/Joint Use Line Water/Gas Meter Box Water/Gas Meter Box Water/Gas Valve Water/Gas Val	Plan View, Graded Surface			irrigation Line (1*=20')	=R R	= IR - / 24* 9 =
Overhead Telephone Line	Plan View, Obliterate Pavement			irrigation Line (I"=100')	-IR	IR IR
Section, Apprentic Contracts in Notion Cools as Section, Apprentic Contracts in Section, Concrete Section, Concrete Section, Metal Storm Drain (1°-20°) & (1°-50°) Section, Metal Section, Wood Section, Wood Section, Aggregate Base Section, Province Light and With Mast Arm North Contract Section, Aggregate Base Section, Base Section, Aggregate Base Section, Ba	Plan View, Wood	577772		Overhead Power/Joint Use Line	-0P	OP
Section, Concrete Section, Metal Storm Drain (1*s20) & (1*s50) Section, Aggregate Base Section, Aggregate Base Section, Aggregate Base Section, Ground Line Cround Line Profile Underground Power/Joint Use Line Underground Telephone Line Underground Telephone Line Telephone Aggregate Base Underground Telephone Line Water/Gas Waive Water/Gas Vaive	Section. Asphaltic Concrete Friction Course			Overhead Telephone Line	-or	-0:
Storm Drain (1*=20) & (1*=50*) Section, Wood Section, Aggregate Base Section, Aggregate Base Section, Ground Line Cround Line Profile Barbed Wire Fence & Gate Chain Link Fence & Gate Chain Link Fence & Gate Coas Line Cas Line	Section, Bituminous Pavement			Sanitary Sewer (["=20")	=sss	=5=-8'5
Section, Medal	Section, Cancrete			Sanitary Sewer (I*=100')	S	s /* · s
Section, Aggregate Base	Section, Metal			Storm Drain ((*=20') & ((*=50')		=53 === 50 === 50 ===
Section, Ground Line	Section, Wood			Storm Drain (I*=100°)		- 20 20 · · · · · · ·
Ground Line Profile Barbed Wire Fence & Gate Chain Link Fence & Gate Chain Link Fence & Gate Guard Rail & Breakaway Cable Terminal Gas Line Gas Line Utility Pole with Down Guy and Anchor Underground Power/Joint Use Line Water/Gas Meter Box Water/Gas Valve Water/Gas Valve Water/Gas Valve Water/Gas Valve	Section, Aggregate Base			Street Light and With Mast Arm	¤ ∞-¤	a co
Barbed Wire Fence & Gate	Section, Ground Line	BURUKU KUKUKU	SUSYRY	Telephone/Power Pedestal	■ T ■ P	□T □P
Chain Link Fence & Gate	Ground Line Profile			Utility Pole with Down Guy and Anchor	$\qquad \qquad \bullet \longrightarrow \qquad \rightarrow$	<u> </u>
Chain Link Fence & Gate Guard Rail & Breakdaway Cable Terminal	Rarbed Wire Fence & Gate			Underground Power/Joint Use Line	-р	_ _p
Gas Line Water/Gas Valve Water/Gas Valve Work of the control of the c	Chain Link Fence & Gate		- 0 00-	Underground Telephone Line	··r 1	_ . ,
Gas Line	Guard Rail & Breakaway Cable Terminal	g	g-0-0-0-0-0	Water/Gas Meter Box	■ ■ WM GM	WM GM
	Gas Line	-c <u> </u>	· e / - 5		wv Gv	wv sv

	CONSTRUCTION D	RAWING SYMBOLS		CONSTRUCTION D	RAWING SYMBOLS
	NEW FEATURES	EXISTING FEATURES		NEW FEATURES	EXISTING FEATURES
Water Line	_#_ <u></u>	-# 	① Depressed Index Contour Line		
Drainage Channel	-	-	Depressed intermediate Contour Line		
Drainage Ditch	Oralnage Oltoh	Dreinage Ditch	Block Wall (1'=20')		
Major Wash		HAME	Median Barrier		
Minor Wash			Fire Hydrant	FH) FH
€ Grade, Profile			Standpipe		O SP
Hedge			Transmission Tower		
Paim Tree		*	\\Indmi!		Å
Shrubbery			Mall Box		<i>P</i>
Unclassified Tree		0	Flag Pole	1	/ / / N
Sign, Single Post	•	d			À
Sign, Multiple Post		d d	North Arrow		•
Dimensions					
Visible Outlines, Sections, etc					. ~
Index Contour Line	8650				
) Intermediate Contour Line					
			OCEAN APPROVED	STATE OF AR	17 ONA REV.
			Laugh O	DEPARTMENT OF TRAI DIVISION OF HIS STANDARD DRA	NSPORTATION 10/95
			promium in the state of the sta	SYMBOL LEGEN	D C-OL13

NO 05509F10H OF REVISIONS MADE BY DATE

| MICHIELD SYMBOL PINE 107-95

Water Line	NEW FEATURES	EXISTING FEATURES			
				NEW FEATURES	EXISTING FEATUR
rainage Channel		-w	Depressed Index Contour Line		
	-		Depressed Intermediate Contour Line		
rainage Ditch	- Drainage Often		Block Wall (1"=20")		
ajor Wash		NAME -	Nedlan Barrier		
inor Wash			Fire Hydrant	FH	Ţ
Grade, Profile			Standpipe		O SP
edge			Transmission Tower		
im Tree		*	Windmill		
nrubbery		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Nail Box		P
nclassified Tree			Flag Pole		/ / / N
ign, Single Post	•	d			À
ign, Multiple Post	3	da	North Arrow		
imensions					
sible Outlines, Sections, etc					N
dex Contour Line	9658				
itermediate Contour Line	8652				
			Jeny X	DEPARTMENT OF TR DIVISION OF F STANDARD DE	HIGHWAYS

NO.	DESCRIPTION OF REVISIONS	MADE BY	1 6
0	COMPRETED SPELLING	PNB	10/
2)	DELETED ANDREWISHING	PHS	10/
3)	REVISED ARREVIATION	PNS	10/
	ADDED ABBREVIATION	PNE	10/
	WORDS		
	A		

WORDS	ABBREVIATION	WORDS	ABBREVIATION	WORDS	ABBREVIATION
A		B (cont)		C (cont)	
Abutment	Abt	Bituminous Surface Treatment	BST	④ Corrugated High Density Polyeth	ylene Plastic Pipe CHDPEPP
Acceleration	Acc	Bituminous Treated Base	втв	Corrugated Steel Pipe	CSP
Acres	Ac	Black Steel Pipe	BSP	Corrugated Steel Pipe Arch	CSPA
Aggregate	Agg	Borrow	Bor	County	Co
Aggregate Base	AB	Boulevard	BLYD. Blvd	Crossing	X-ING
Ahead	AHD, Ahd	Boundary	3 Bdry	Cross Section	X-SECT
Alternate	AIT	Brass Cap	8C	Crown	Cr
Aluminum	Al	Breakaway Cable Terminal	ВСТ	Cubic	Cu
American Association of State Highway	OTHZAA	Bridge	8r	Cubic Feet Per Second	CFS
and Transportation Officials		Building	Bldg	Cubic Yard or Cubic Yards	CY, Cu Yd
American Concrete Institute	ACI	С		Culvert	③ Culv
American institute of Steel Construction	AISC	Calculated	Calc	Curb and Gutter	C&G
American Road and Transportation	ARTBA	Cast-In-Place	C-I-P	Curve to Spiral	CS
Builders Association		Cast Iron	CI	ם	
American Society for Testing Materials	ASTM	Cast Iron Pipe	CIP	Deceleration	Dei
Amount	Amt	Catch Basin	СВ	Deflection	Def
Approach	Appr	Cattle Guard	cc	Deflection of Total Curve	Ī
Approximate	Approx	Cement	Cem	Degree of Curve	D
Asphalt	Asph	Cement Treated Base	ств	Delineator	Del
Asphalt Rubber	AR	Center	Ctr	Delta	Δ
Asphalt Rubber ACFC	ARACEC	Center Line	Ę	Depressed Curb	DC
Asphaltic Concrete	AC	Center to Center	C to C	Design Speed	Des Spd
Asphaltic Concrete Base	ABC	Channel	Chan	Detail	Dtl
Asphaltic Concrete Friction Course	ACFC	Class	CI	Diameter	Dia
Asphaltic Concrete Surface Course	ACSC	Clear	Cir	Distance	Dist
Avenue	AVE, Ave	Column	Col	Division	Div
Average Dally Traffic	ADT	Compact or Compaction	Comp	Double	Dbl
8		Complete in Place	C in P	Drain or Drainage	Drn
Back	BK, Bk	Concrete	Conc	Drainage Area	DA
Backfill	Bk f	Concrete Box Culvert	CBC	Drawing	Dwg
Ralance	Bai	Concrete Treated Base	СТВ	Drive	Dr
Bank Protection	Bank Prt	Connection	Conn	Driveway	Dwy
Barbed Wire	BW	Conduit	Cond	Ductile Iron Pipe	DIP
Bearing	Brg	Construct or Construction	Cst	E	 .
Begin	Bgn	Continous	Cont	- Each	Ев
Begin Curb Return	BCR	Coordinate	Coord	Easement	Esmt
Begin Full Super	BFS	Corner	Cor	East	E
Bench Wark	BM	Correction	Corr	Eastbound	EB
Bevel or Beveled	Bev	Corrugated Aluminum Pipe	CAP		20
Bituminous	BI+	Corrugated Aluminum Pipe Arch	CAPA	DESIGN APPROVED	
Bituminous Mixture	BI+ MIx		-	Length On	STANDARD DRAWINGS
				Zowald and Co	GENERAL ABBREVIATIONS C-01.30

WORDS	ABBREVIATION	WORDS	ABBREVIATION	WORDS	ABBREVIATION	
A		B (cont)		C (cont)		
Abutment	Abt	Bituminous	BI†	Corrugatea Aluminum Pipe	CAP	
Acceleration	Acc	Bituminous Mixture	Bit Mix	Corrugated Aluminum Pipe Arch	CAPA	
Acres	Ac	Bituminous Surface Treatment	BST	Corrugated Steel Pipe	CSP	
Aggregate	Agg	Bituminous Treated Base	ВТВ	Corrugated Steel Pipe Arch	CSPA	
Aggregate Base	AB	Black Steel Pipe	BSP	County	Co	
Ahead	AHD, Ahd	Borrow	Bor	Crossing	X-ING	
Alternate	Alt	Boulevard	BLVD. BIVd	Cross Section	X-SECT	
Aluminum	ΑI	Boundary	Bdy	Crown	Cr	
American Association of State Highway	AASHTO.	Brass Cap	BC	Cubic	Cu	
and Transportation Officials		Breakaway Cable Terminal	BCT	Cubic Feet Per Second	CFS	
American Concrete Institute	ACI	Bridge	Br	Cubic Yard or Cubic Yards	CY. Cu Yd	
American Institute of Steel Construction	AISC	Building	Bldg	Culvert	CIV	
American Road and Transportation	ARTBA	c		Curb and Gutter	C&G	
Builders Association		Calculated	Calc	Curve to Spiral	cs	
American Society for Testing Materials	ASTM	Cast-In-Place	C-I-P	D		
Amount	Amt	Cast Iron	CI	Deceleration	Del	
Approach	Appr	Cast Iron Pipe	CIP	Deflection	Def	
Approximate	Approx	Catch Basin	СВ	Deflection of Total Curve	1	
Asphalt	Asph	Cattle Guard	CC	Degree of Curve	D	
Asphalt Rubber	AR	Cement	Cem	Delineator	Del	
Asphait Rubber ACFC	ARACFC	Cement Treated Base	СТВ	Delta	Δ	
Asphaltic Concrete	AC	Center	Ctr	Depressed Curb	DC	
Asphaltic Concrete Base	ABC	Center Line	٩	Design Speed	Des Spd	
Asphaltic Concrete Friction Course	ACFC	Center to Center	C to C	Detail	D+I	
Asphaltic Concrete Surface Course	ACSC	Channel	Chan	Diameter	Dla	
Avenue	AVE. AVe	Class	CI	Distance	Dist	
Average Dally Traffic	ADT	Clear	Cir	Division	DIv	
В		Column	Cot	Double	Dbi	
Back	BK, Bk	Compact or Compaction	Comp	Drain or Drainage	Drn	
Back fill	Bkfl	Complete in Place	C in P	Drainage Area	DA	
Balance	Bal	Concrete	Conc	Drawing	Dwg	
Balance Point	BP	Concrete Box Culvert	CBC	Drive	Dr	
Bank Protection	Bank Prt	Concrete Treated Base	СТВ	Driveway	Dwy	
Barbed Wire	B₩	Connection	Conn	Ductile Iron Pipe	DIP	
Bearing	Brg	Conduit	Cond	E		
Begin	Ban	Construct or Construction	Cst	Each	Еа	
Begin Curb Return	BCR	Continous	Cont	Easement	Esmt	
Begin Full Super	BFS	Coordinate	Coord	East	E	
Bench Mark	ВМ	Corner	Cor	Eastbound	EB	
Bevelor Beveled	Bev	Carrection	Corr	CESCH APPROVED LIMEY H. Otterne. BERREITER FOR BERREITER	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/

	8	DESCRIPTION OF REVISIONS	B302 B7	201	г
	Ó	MEVISED SPELLING	P16	10/95	l
	(2)	HEVISED ABBREVIATION	FNE	10/95	l
	(3)	ADDED ABBREVIATION	PHS	10/95	ı
	О				ı
ı	F				-

		1.50	, ,		
WORDS	ABBREVIATION	WORDS	ABBREVIATION	WORDS	ABBREVIATION
E (cont)		G (cont)		M (cont)	
Edge of Pavement	EP	Ground	Gnd	Mile or Miles	MI
Electric, Electricity	Elec. E	③ Ground Compaction	Gnd Comp	Mile Post	MP
Elevation	Elev	Grubbing	Grb	Miles Per Hour	MPH
Embankment	Emb	Guard	Grd	Mineral Aggregate	MA
End Curb Return	ECR	Guard Rail	GR	Minimum	Min
① End Full Superelevation	EFS	3 Guard Rail Extruder Terminal	GET	Miscellaneous	Misc
Engineer	Engr	н		Modify or Modified	Mod
Entrance	Ent	Headwall	Hdwi	Monument	Man
Equation	EO, Eq	Height	Ht, H, h	Mountain	Mt
Estimate	Est	Height of instrument	н	N	***
Excavation	② Exc	Head Water	H₩	National	Nati
Existing	Exst	Highway	Hwy	Non-Reinforced Cast-In-Place	NRCIPCP
Expansion Joint	Exp Jt	Horizontal	② Horz	Concrete Pipe	THICH GI
Extend or Extension	Ex†	Horizontal Elliptical Reinforced	HERCP	Normal Crown	NC
External	Ext	Concrete Pipe	HERO	North	nc N
F	Εα.	I		Northbound	N NB
Federal	Fed	' Improvement	Impr	Number	
Feet or Foot	F†	inch or inches		O	No
Feet per Foot		**	In	<u>-</u>	
	FPS	include, included or inclusive	incl	Obliterate	ОЫ
Feet Per Second		Inside Diameter	ID	Original	Orig
Figure	Fig	Invert	Inv	Outside Diameter	00
Finish	Fin	irrigation	irr	Overhead	ОН
Floor	FI	J		Overpass	OP
Flow Line	FL	Joint	J+	P	
Footing	Ftg	Junction	Jc†	Parkway	Pkwy
Forest	Fst	L		Pavement	Pvmt
Found	Fnd	Laboratory	Lab	Pedestrian	Ped
Frame	Fr	Lateral	Lat	Place	PI
Freeway	Fwy	Lef†	L†	Point	Pt
Frontage	Frt	Length or Length of Curve	L	Point of Compound Curvature	PCC
Furnish or Furnished	Furn	3 Length of Normal Crown Removal	L _C	Point of Curvature	PC
Futura	Fut	 Length of Spiral 	Ls	Point of Intersection	PI
G		 Length of Superelevation Runoff 	L _s	Point of Reverse Curvature	PRC
Gas	G	Line	Ln	Point of Tangency	PĪ
Gas Meter	GM	Linear or Lineal	Lin	Point on Curve	POC
Gas Valve	GV	Linear Feet	Lin Ft	Point on Semi-Tangent	POST
Galvanize or galvanized	Galv	Location	Loc	Point on Spiral	POS
Gauge	Ga	M		Point on Tangent	POT
Government	② Gov't	Manhole	MH	Polyethylene	PE
Grade	Gr	Material	M†!	DESIGN INNOVER	
Grade Seperation	GS	Maximum	Max	1 1/24	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION
•		Median	Med	Lengt Otte	DIVISION OF HIGHWAYS STANDARD DRAWINGS
				APPROVED FOR OISTRIBUTION	DRAWING NO.
				Constabille	GENERAL ABBREVIATIONS C-01.31

C DESCRIPTION OF REVISIONS	HADE BY	DATE
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WORDS	ABBREVIATION	WORDS	ABBREVIATION	WORDS	ABBREVIATION
E (cont)		G (cont)		M (cont)	
Edge of Pavement	EP	Grade	Gr	Mile or Miles	MI
Electric, Electricity	Elec, E	Grade Seperation	GS	Mile Post	MP
Elevation	Elev	Ground	Gnd	Miles Per Hour	MPH
Embankment	Emb	Grubbing	Grb	Mineral Aggregate	MA
End Curb Return	ECR	Guard	Grd	Minimum	Min
End Full Super	EFS	Guard Rall	GR	Miscellaneous	Misc
Engineer	Engr	Н		Modlfy or Modified	Mod
Entrance	Ent	Headwall	Hdw	Monument	Mon
Equation	EQ, Eq	Height	Ht. H. h	Mountain	M†
Estimate	Est	Height of Instrument	н	N	
Excavation	E×	Head Water	H₩	National	Nati
Existing	Exst	Highway	Hwy	Non-Reinforced Cast-In-Place	NRCIPCP
Expansion Joint	Exp Jt	Horizontal	Hor	Concrete Pipe	
Extend or Extension	Ext	Horizontal Elliptical Reinforced	HERCP	Normal Crown	NC
External	Ext	Concrete Pipe		North	N
F		I		Northbound	NB
Federal	Fed	Improvement	Impr	Number	No
Feet or Foot	F†	Inch or Inches	In	0	
Feet per Foot	2/11	include, included or inclusive	Incl	Obliterate	ОЫ
Feet Per Second	FPS	Inside Diameter	(D	Original	Orig
Figure	Fig	Invert	Inv	Outside Diameter	OD
Finish	Fîn	Irrigation	Irr	Overhead	ОН
Floor	FI	J		Overpass	OP
Flow Line	FL	Joint	J†	P	
Footing	F†g	Junction	Jc+	Parkway	Pkwy
Forest	Fst	L		Pavament	Pvmt
Found	Fnd	Laboratory	L <i>e</i> b	Pedestrian	Ped
Frame	Fr	Lateral	Let	Place	PI
Freeway	Fwy	Lef†	L†	Point	P+
Frontage	Frt	Length or Length of Curve	L	Point of Compound Curvature	PCC
furnish or Furnished	Furn	Line	Ln	Point of Curvature	PC
Future	Fut	Linear or Lineal	Lin	Point of Intersection	PI
G		Linear Feet	Lin Ft	Point of Reverse Curvature	PRC
Gas	G	Location	Loc	Point of Tangency	PT
Gas Meter	GM	M		Point on Curve	POC
Cas Valve	GV	Manhole	MH	Point on Semi-Tangency	POST
Calvanize or galvanized	Galv	Material	M†1	Point on Spiral	POS
Gauge	Ga	Maximum	Max	Point on Tangent	POT
Government	Gov+	Median	Med	Polyethylene	PE
				Jany 1 Otte	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS

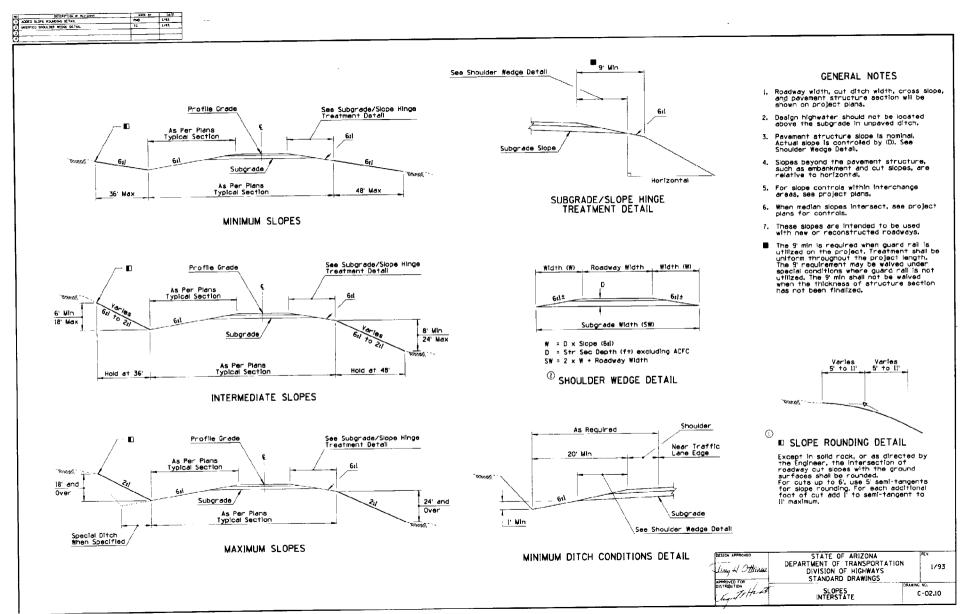
WORDS	ABBREVIATION		WORDS	ABBREVIATION	WORDS	ABBREVIATION
P (cont)			S		T (cont)	
Polyvinyi Chloride	PVC		Salvage	Salv	Telephone	Tel
Portland Cement Concrete	PCC		Section	Sc†	Temporary	Temp
Portland Cement Concrete Pavement	PCCP		Select Material	SM	Temporary Construction Easement	TCE
Pounds	Lbs		Sheet	Sh	Timber	Tor
Pounds Per Square Inch	PS1		Shoulder	Shidr	Top of Curb	тс
Preliminary	Prelim		Shrinkage	Shr	Topography	Торо
(i) Prestress, Prestressed or Prestressing	PS		Sidewalk	S₩#ĸ	Township	Т
Project	Prj	2	Sight Distance-Stopping	SD _S	Traffic Interchange	ті
Property Line	P/L		Single	Sgl	Transition	Trns
Proposed	Prop		Skew	Sk	Turning Point	TP
Protection	Prt		South	s	Turnout	то
Provision or Provide	Prv		Southbound	SB	Typical	Тур
a			Special	Spcl	u	
Quadrant	Quad		Specification	Spec	Underground	Ugnd
Quantity or Quantities	Quan		Spiral Rate of Change	a	Underpass	⊔P
Quantity of Drainage Runoff	0		Spiral To Curve	sc	V	
R			Spiral To Tangent	21	Variable	Var
Radius	R		Square	Sq	Vertical	Vert
Railroad	RR		Square Feet	Sq Ft	Vertical Curve	vc
Range	R		Square Yard	Sq Yd	Vertical Elliptical Reinforced	VERCP
Reconstruct	Recst		Standard	Std	Concrete Pipe	
Reference	Ref		State Route	SR	Vertical Point of Intersection	VPI
Reinforced or Reinforcing	Reinf		Station	Sta	Viaduct	Via
Reinforced Concrete	RC		Street	St	Vitrified Clay Pipe	VCP
Reinforced Concrete Pipe	RCP		Structure or Structural	Str	Volume	Vol
Reinforced Concrete Pipe Arch	RCPA		Subdivision	Subdiv	W	
Reinforcing Bar	Rebar		Subgrade	SC	Water	w
Relocate, Relocation or Relocated	Reloc		Subgrade Seal	SS	Water Meter	WM
Remove	Rem		Superelevation	③ e or Super	Water Valve	WV
Required	Reqd		Surface	Surf	Welded Wire Fabric	WWF
Reservation	Resv		Survey	Sur	West	w
Residence	Res		Swell	Sw	Westbound	WB
Retain or Retaining	Ret	1	Symmetrical	Sym	Western Wood Products Association	WWPA
Revised or Revision	Rev		Т		Wide or Width	w
Right	R†		Tangant	Tan	Wood	₩d
Right of Way	R/W		Tangent Length	т	Y	
Road	Rd		Tangent to Spiral	TS	Yard	Yd
Roadway	Rdwy		Telegraph	Tig		
Route	Rte					
Rubber Gasket Reinforced Concrete Pipe	RGRCP				DESIGN APPROVED LEMY HOTELLING APPROVED FOR STREET FOR	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS

GENERAL ABBREVIATIONS

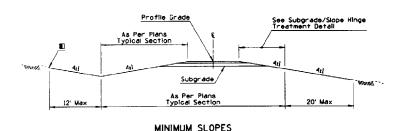
C-01.32

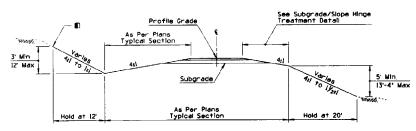
DESCRIPTION	ON OF REVISIONS	YB 30AW	UAI
REISSUE STO		PN6	7/94
MEISSUE STO			+-
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	ABBREVIATION	WORDS	ABBREVIATION	WORDS	ABBREVIATION
WORDS	ADDREVIATION	MORDS S	REGILE THE TANK	T (cont)	
P (cont)	PVC	Salvage	Salv	Telephone	₹el
Palyvinyi Chioride	PCC	Section	Sct	Temporary	Temp
Portland Coment Concrete	PCCP	Select Material	SM	Temporary Construction Easement	TCE
Portland Cement Concrete Pavement		Sheet	\$h	Timber	Tbr
Pounds	Lbs PSI	Shoulder	Shide	Top of Curb	τc
Pounds Per Square Inch	Prelim	Shrinkage	Shr	Topography	Topo
Preliminary	PS PS	Sidewalk	Swik	Township	T
Prestess, Prestessed or Prestessing		Signt Distance-Intersection	SD	Traffic Interchange	τι
Project	Prj	Sight Distance-Passing	SD _P	Transition	Trns
Property Line	P/L	Sight Distance-Stopping	SO _S	Turning Point	TP
Proposed	Prop	•	Sal	Turnout	TO
Protection	Pri	Single Skew	Sk	Typical	Тур
Pravision or Provide	Prv	South Skew	S	U	
a	0	Southbound	SB	Underground	Ugnd
Quadrant	Quad	Special	Spci	Underpass	UP
Quantity or Quantities	Quan	Special Specification	Spec	V	
Quantity of Drainage Runoff	O	Spiral Rate of Change	a	Variable	Var
R	_	Spiral To Curve	SC	Vertical	Vert
Radius	R	Spiral To Tangent	ST	Vertical Curve	vc
Railroad	RR	· ·	Sq	Vertical Elliptical Reinforced	VERCP
Range	R	Square	Sq F†	Concrete Pipe	
Reconstruct	Recst	Square Feet	Sq Yd	Vertical Foint of Intersection	VPI
Reference	Ref	Square Yard	Std	Viaduct	Via
Reinforced or Reinforcing	Reinf	Standard	SR	Vitrified Clay Pipe	VCP
Reinforced Concrete	RC	State Route	Sta	Volume	Vol
Reinforced Concrete Pipe	RCP	Station	S†	W	
Reinforced Concrete Pipe Arch	RCPA	Street	Str	Water	W
Reinforcing Bar	Rebar	Structure or Structural	Subdly	Water Meter	WM
Relocate, Relocation or Relocated	Reloc	Subdivision	SC	Water Valve	wy
Remove	Rem	Subgrade	SS	Welded Wire Fabric	wwF
Required	Reqd	Subgrade Seal	Super	West	w
Reservation	Resv	Superelevation	Surf	Westbound	wB
Residence	Res	Surface		Western Wood Products Association	WWPA
Retain or Retaining	Ret	Survey	Sur s	Wide or Width	w
Revised or Revision	Rev	Swell	Sw	Wood	wd
Right	R1	Symetrical	Sym	**************************************	,,,
Right of Way	R/W	т	7	T Yand	Yd
Road	Rd	Tangent	Tan *	161 (. •
Roadway	Rdwy	Tangent Length	T TC		
Route	Rte	Tangent to Spiral	TS.		Tark Tark
Rubber Gasket Reinforced Concrete Ptg	PE RGRCP	Telegraph	Tig	BESIGN APPROVED LEWY H. HATTAGE APPROVED TOR BESTRUCTURE	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS

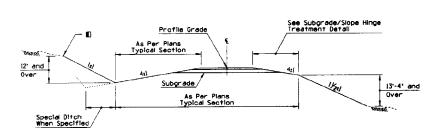




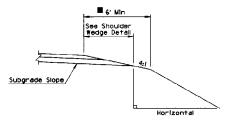




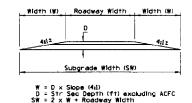
INTERMEDIATE SLOPES



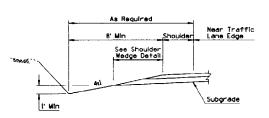
MAXIMUM SLOPES



SUBGRADE/SLOPE HINGE TREATMENT DETAIL

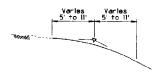


SHOULDER WEDGE DETAIL



GENERAL NOTES

- Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.
- Design highwater should not be located above the subgrade in unpaved ditch.
- Pavement structure slope is nominal, Actual slope is controlled by (D). See Shoulder Wedge Detail.
- Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.
- These slopes are intended to be used with new or reconstructed roadways.
- 1 The 6 min is required when guard rall is utilized on the project. Treatment shall be uniform throughout the project length. The 6 requirement may be walved under special conditions where guard rall is not utilized. The 6 min shall not be walved when the thickness of structure section has not been finalized.

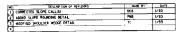


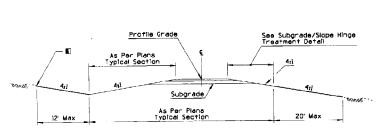
■ SLOPE ROUNDING DETAIL

Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded. For cuts up to 6, use 5' semi-tangents for slope rounding, for each additional floot of cut add i' to semi-tangent to ll' maximum.

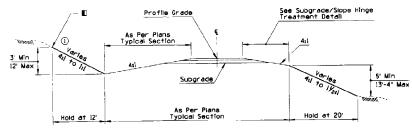
MINIMUM DITCH CONDITIONS DETAIL

DIVISION OF HIGHWAYS STANDARD DRAWINGS	107 33
STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION	10/95

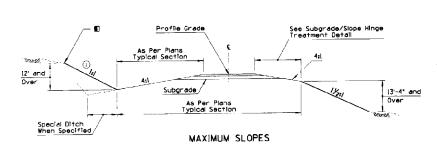




MINIMUM SLOPES

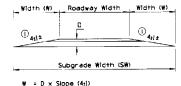


INTERMEDIATE SLOPES

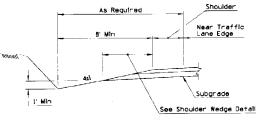


See Shoulder Wedge Detail 6: Min Subgrade Slope

SUBGRADE/SLOPE HINGE TREATMENT DETAIL

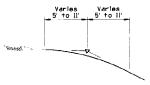


- 0 = Str Sec Depth (ft) excluding ACFC
 SW = 2 x W + Roadway Width
- 3 SHOULDER WEDGE DETAIL



GENERAL NOTES

- Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.
- Design highwater should not be located above the subgrade in unpaved ditch.
- Pavement structure slope is nominal, Actual slope is controlled by (D). See Shoulder Wedge Detail.
- Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.
- These slopes are intended to be used with new or reconstructed roadways.
- The 9 min is required when quard rail is utilized on the project. Freatment shall be uniform throughout the project length. The 9 requirement may be valved under special conditions where guard rail is not utilized. The 9 min shall not be walved when the thickness of structure section has not been finalized.

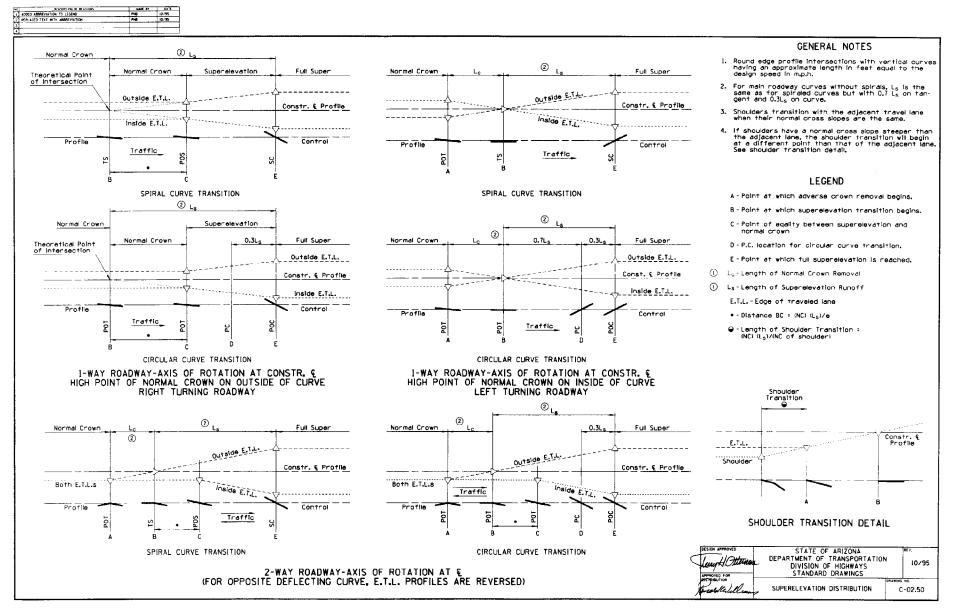


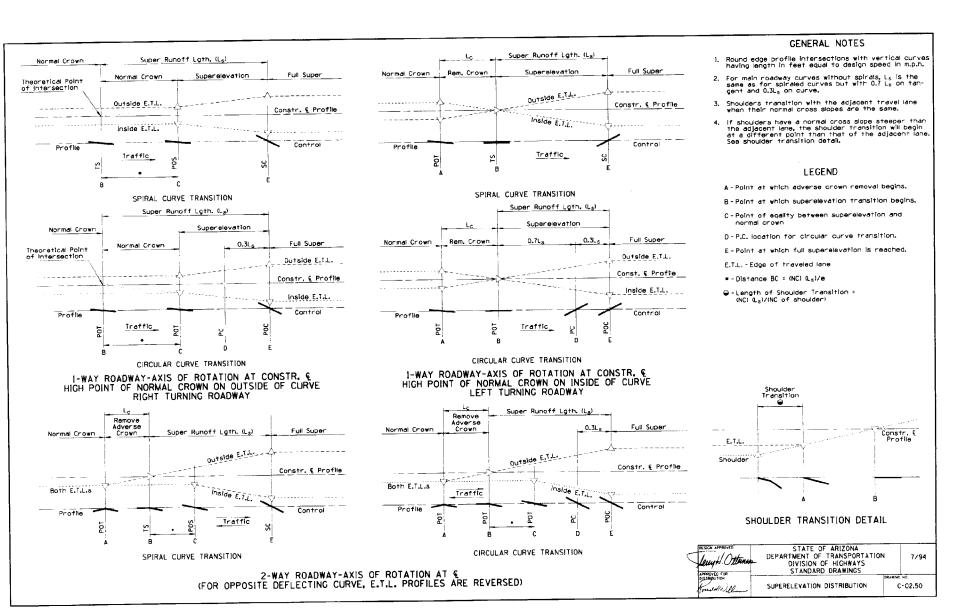
■ SLOPE ROUNDING DETAIL

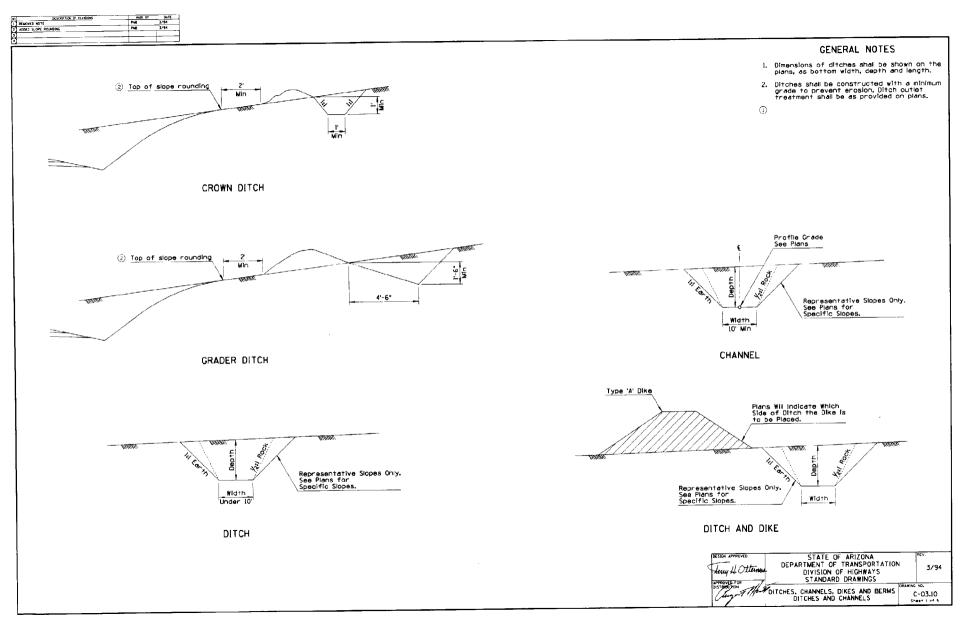
Except in soils rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded. For cuts up to 6; use 5' semi-tangents for slope rounding. For each additional foot of cut add i' to semi-tangent to 11' maximum.

MUMINIM	DITCH	CONDITIONS	DETAIL

DESIGN APPROVED	STATE OF ARIZONA	REv.
Lerry H. Otteress	DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	1/93
Jugar House	SLOPES	C-02-30



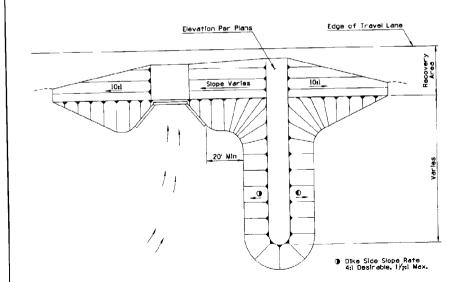








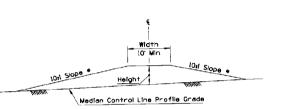
SLOPE	TABLE		
Inside Recovery Area	Dutside Recovery		
	Desirable	Maximum	
i Oal	4:1	11/211	



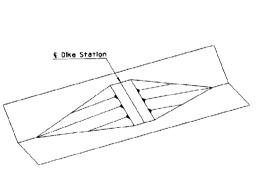
② TYPICAL DIKE INSTALLATION AT STRUCTURE Place dikes at structures to create water cushion.

GENERAL NOTES

- Dimensions of dikes shall be shown on the plans as top width, height, length and top of dike elevation.
- Dike side slopes outside the recovery area shall be shown on the plans.

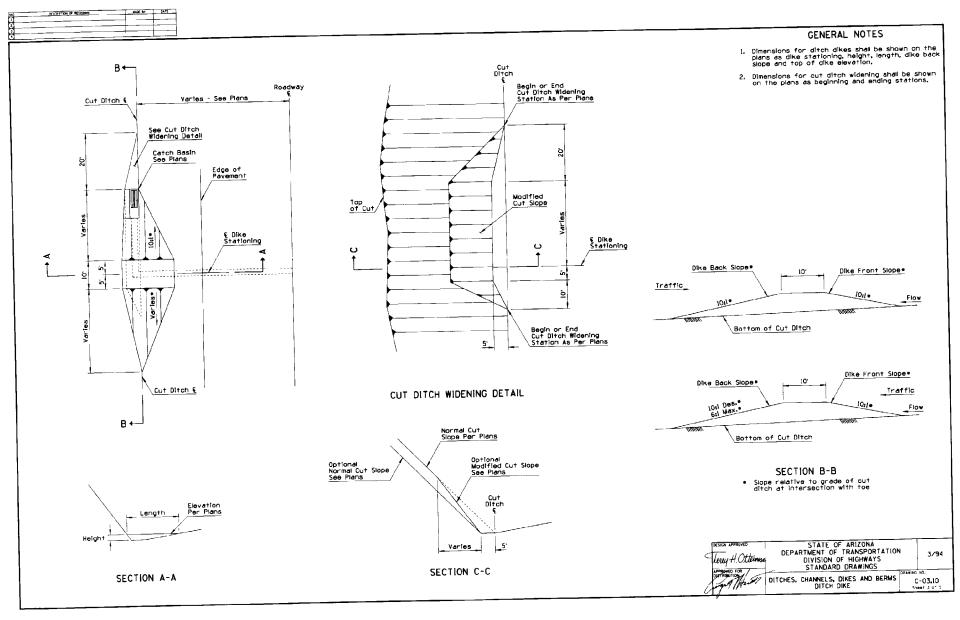


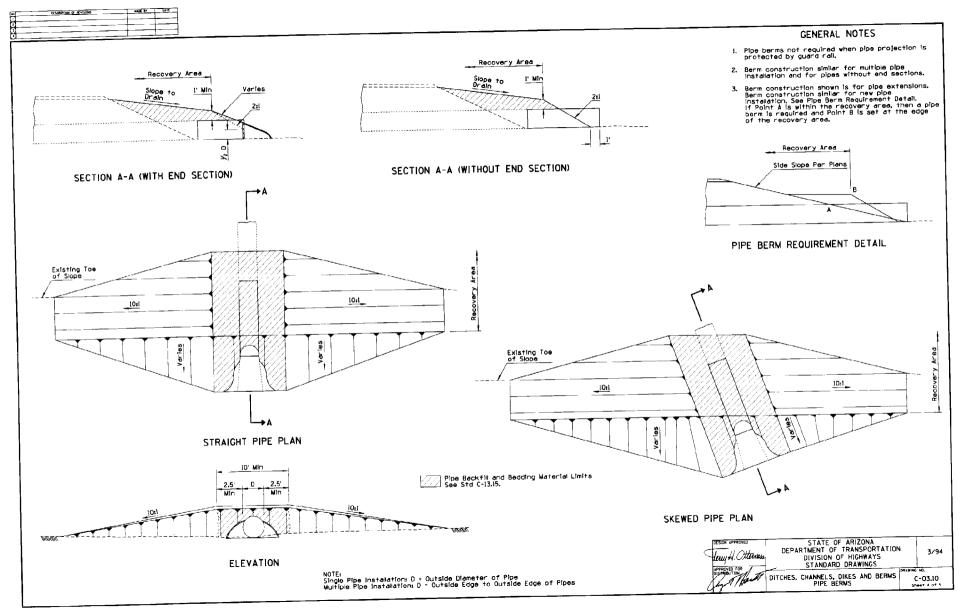
TYPE B TRANSVERSE MEDIAN DIKE * Siope relative to grade of median at intersection with toe

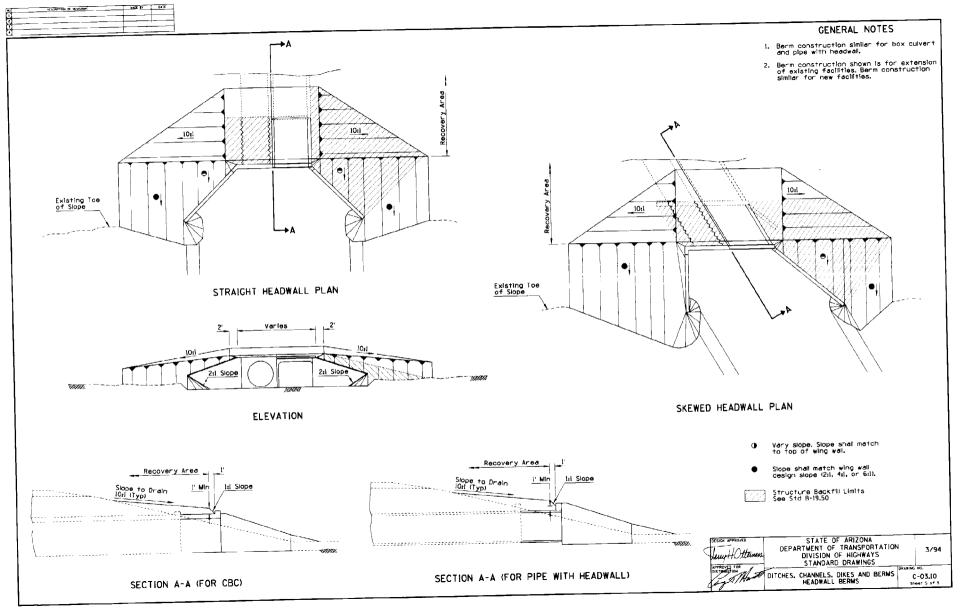


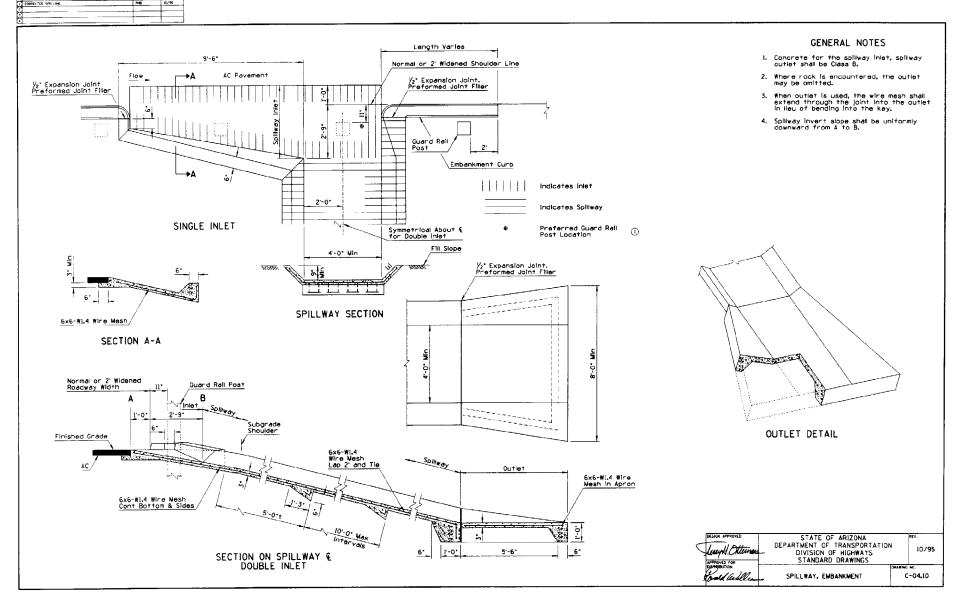
3 TYPICAL TRANSVERSE MEDIAN DIKE INSTALLATION

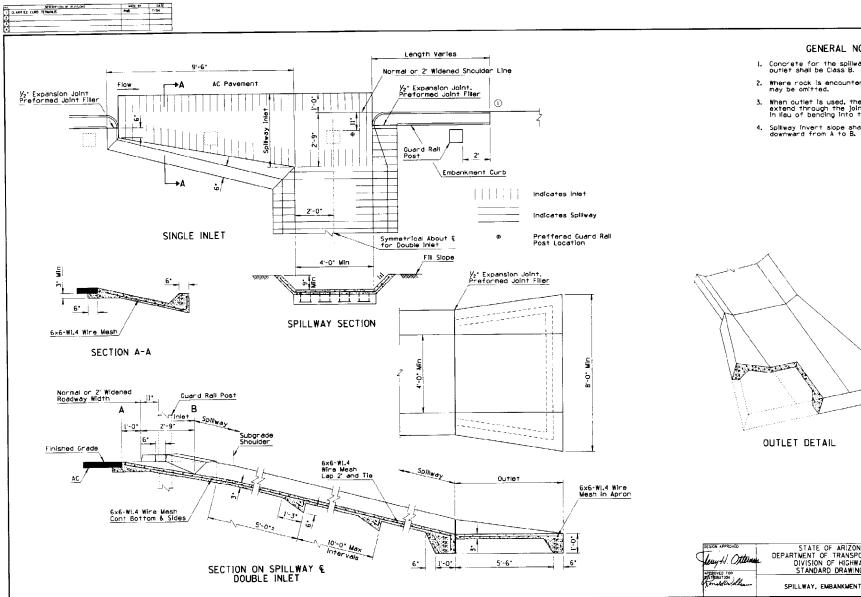
DESIGN APPROVED LELLY HI. Ottlines APPROVED FOR 1	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	3/94
CINTRIBUTION CONTRIBUTION	DITCHES, CHANNELS, DIKES AND BERMS DIKES	C-03.10 Sheat 2 of 5





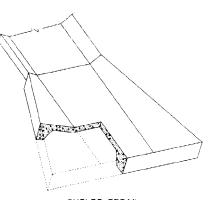




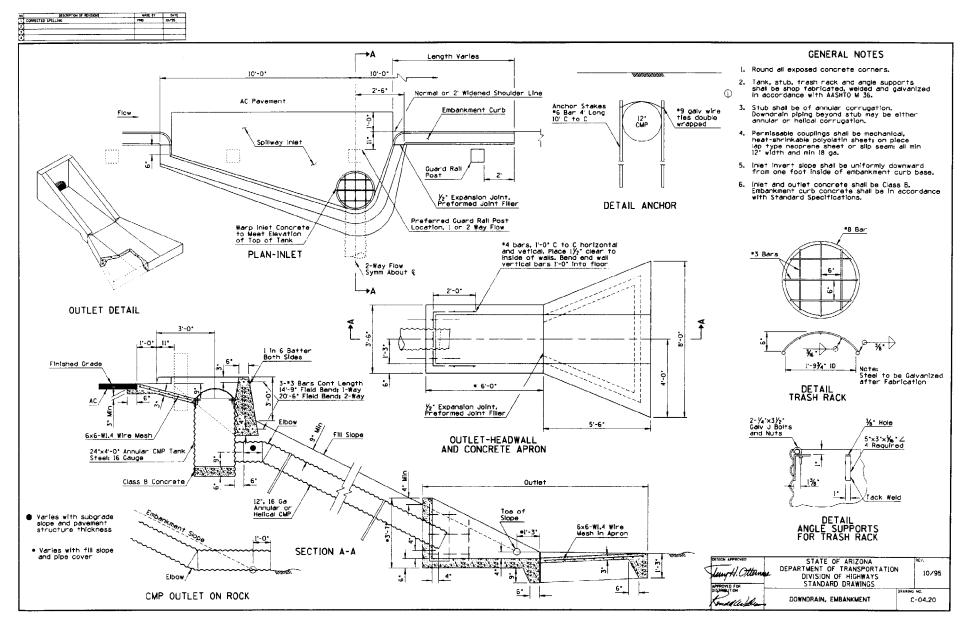


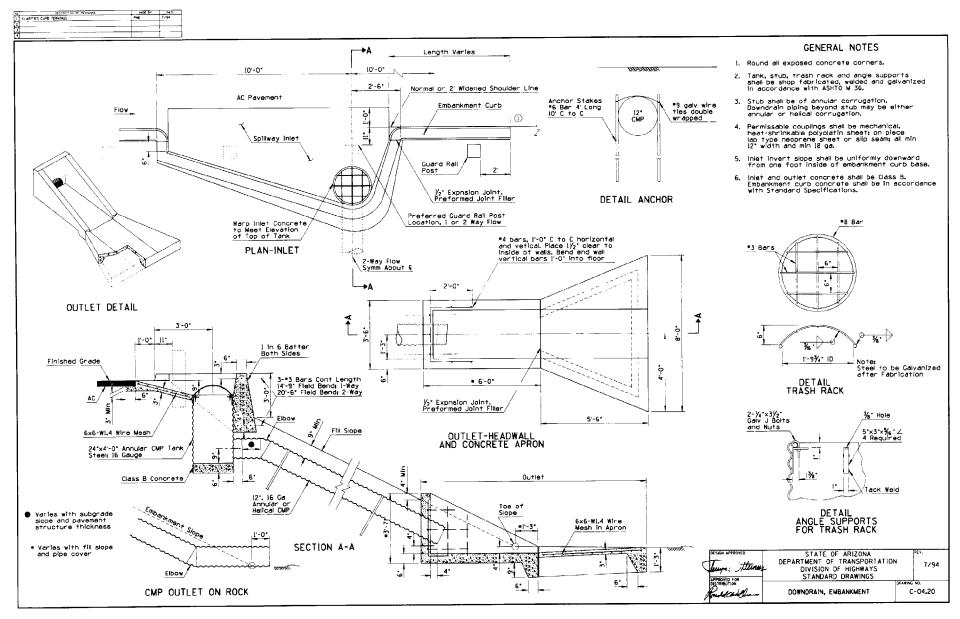
GENERAL NOTES

- Concrete for the spillway inlet, spillway outlet shall be Class B.
- 2. Where rock is encountered, the outlet
- When outlet is used, the wire mesh shall extend through the joint into the outlet in lieu of bending into the key.
- Spillway invert slope shall be uniformly downward from A to B.



STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION 7/94 DIVISION OF HIGHWAYS STANDARD DRAWINGS C-04.10





										LE	NG	ГΗ	OF	SPI	LLW	YAY												
hickness											Emb	ankr	nent	Hei	ght													
•	5'	6'	7'	8'	9,	10'	11'	12'	131	14'	15	16.	17'	18'	19'	20'	21'	22'	23'	24'	25'	56.	27.	28	29,	30'	31	32
12.	32'	37	43	49	50.	50	51'	52'	52'	52'	52'	53'	53'	54'	54'	54'	55'	551	56'	56'	57'	57'	58	581	59,	59'	60'	60'
13.	33	38	44'	50'	50'	51'	51'	52'	52'	52'	53'	53'	53'	54'	54'	55'	55'	56	56'	57'	57'	58'	58'	59'	59'	60,	60'	61
14"	33'	38	44'	50	51'	51'	52'	52'	53	53'	53	54'	54'	54'	55'	55'	56'	56'	57'	57'	58	58'	59	59'	60'	60'	61'	61'
15*	34'	39	45	51	51'	52'	52'	53'	531	54'	54	54'	55'	55'	55'	56'	56'	57'	57'	58'	58'	59	59	60'	60'	61'	61'	62
16*	34	39	45'	51'	52'	52'	53'	53'	54	54'	54	55'	55'	56'	56'	561	57'	57'	581	58	59'	59'	60'	60'	61'	61,	62	62
17*	35'	40'	46'	52'	52'	53'	53'	54'	54'	55'	55'	55'	56'	56'	57'	57'	57'	58'	58'	59	59'	60,	60,	61'	61'	62'	62'	63
18"	351	40'	46'	52'	53'	53'	54'	541	55'	55'	55	56'	56'	57	57	57	58'	58	59'	59'	60'	60'	61'	61'	62'	62.	63	63
19*	36.	41'	47'	53'	53'	54	54'	55'	55'	56'	56	56'	57'	57'	58'	581	58'	59	59'	60'	60,	61'	61'	62'	62'	63.	63	64
20"	36	41.	47	53'	54'	54'	55'	55'	56'	56'	56	57'	57'	58'	58'	58'	59'	59.	60.	60,	61.	61.	62	62'	63	63.	64	64
21*	37	42'	48'	54'	54	55'	55'	56'	56'	57'	57'	57'	58'	58'	59'	59	59'	60'	60,	61	61'	62'	62'	63'	63'	64'	64'	65
22.	37	42'	48'	54'	55'	55'	56	56.	57	57	57'	58'	58'	59'	59'	59'	60.	60.	611	611	62,	62'	63'	631	64'	64'	65	65
23.	38	43	49'	55'	55'	56'	56'	571	57'	58'	58	58'	59'	59'	60'	60.	60.	61'	61'	62'	62'	63	63'	64'	641	65'	65	66
24*	381	43'	49'	55'	56'	56'	57	57'	581	58'	58'	59	59	60,	60,	60,	61'	61	62'	62'	63'	63'	64'	641	65'	65.	66'	66
25"	39.	44'	50'	56'	56'	57'	57	58'	58'	59	59	59'	60,	60,	61'	61'	611	62,	62'	63'	63'	64'	64'	65'	65	66'	66	67
26'	39	44	50'	56	57	57'	581	58'	59	59	59	60'	60'	61'	61'	61'	62'	62	63	63 [,]	64'	64'	65	651	66,	66'	67	67
27'	40'	45'	51'	57	57'	58'	58'	59'	59	60,	60,	60'	61,	61'	62'	62'	62'	63	63'	64'	64	65'	65'	66'	66	571	67	68
28'	40'	45'	51'	57'	58'	58'	59'	59'	60	60'	60'	61,	61'	62'	62'	62'	63'	63	641	64'	65'	65'	66'	66'	67'	67'	68	68
29'	41'	46'	52'	58'	58'	591	59'	60'	60	61'	61	61'	62'	62.	63'	63	63'	64	64	65'	65'	66	66	67'	67	68'	68'	69
30.	41'	46'	52	58	59	59	60'	60,	61	61'	61	62	62'	63	63'	63	64	64	65'	65'	66'	66,	67'	67'	68	68'	69'	69
31.	42'	47'	53'	59	59	60'	60,	61'	61	62	62'	62'	63,	63'	64'	641	641	65	65,	66,	66'	67'	67'	68'	68	69'	69,	70
32.	42	47	53	59	60	50	61'	61	62	62	62	63	63	641	64'	64	65'	65	66'	66.	671	67	68,	68'	69	69'	70'	70
33'	43'	48'	54	60	60'	61'	61'	62'	62	63'	63	631	64	64	65'	65'	65'	66'	66	67'	67'	68'	68'	69.	69	70'	70'	71

C-02 10	AND	C-02.20	SLOPES

43' 48' 54' 60' 61' 61' 62' 62' 63' 63' 63' 63' 64' 64' 65' 65' 65' 66' 66' 67' 67' 68' 68' 68' 69' 69' 70' 70' 71' 71'

44' 49' 55' 61' 61' 62' 62' 63' 63' 63' 64' 64' 64' 65' 65' 66' 66' 66' 67' 67' 68' 68' 69' 69' 70' 70' 71' 71' 72'

44' 49' 55' 61' 62' 62' 63' 63' 63' 64' 64' 64' 65' 65' 66' 66' 66' 67' 67' 68' 68' 69' 69' 70' 70' 71' 71' 72' 72'

341

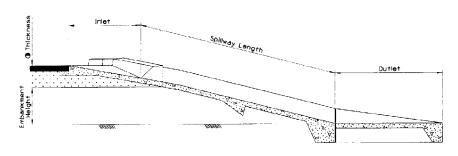
35'

1	.EN	GTH	OF	S	PILL	WA	Y		
Thickness			Emb	ankr	ent	Hel	ght		
•	5'	6'	7'	8,	9'	10'	11'	12'	13
12'	22'	22'	22'	23'	23'	24'	24'	24'	25
13'	22'	22'	23'	23'	23'	24'	24'	25'	25'
14'	22'	23'	23	23'	24'	24'	25'	25'	26
15'	23'	23'	23'	24'	241	25'	25'	251	26'
16'	23'	23'	24'	24'	24'	25'	25'	26'	26'
17'	23	24'	24'	24'	25'	25'	26'	261	27
18.	24'	24'	25	25'	25'	26'	26'	27'	27
191	24'	24'	25'	25'	25'	26'	26'	27'	27
20'	25'	25'	25'	25'	26'	26'	27'	27'	28
21*	25'	25'	25'	26'	26,	27'	27'	28'	28'
22'	25.	25.	26'	26'	27	27'	27	58,	28
23'	26'	26'	26'	26'	27'	27'	28'	28'	29
24'	26'	26'	26'	27'	27'	28'	28'	29'	29
25'	26'	27'	27'	27'	28'	28'	28'	29'	29
26'	27'	27'	27'	28'	28	28	29'	29	30
27'	27'	27'	28.	28'	28'	29'	29,	30'	30
28.	27	28	28'	28	29	29	29.	30,	30
29'	28	28'	28'	29,	29'	29	30,	30	311
30'	28'	28'	29'	29'	29'	30'	30'	31'	31
311	28'	29	29	29	30'	30,	31.	311	32
32'	29'	29'	29'	30'	30'	30'	31'	31'	32
33'	29'	59,	30,	30,	30,	311	31,	32'	32
34'	291	30'	30,	30,	31'	31'	32'	32'	33'
35'	30'	30'	30'	31'	31'	31'	32'	32'	331
36.	30	30.	31'	31'	31'	32'	32'	331	33'

C-02.30 SLOPES

GENERAL NOTES

- For C-02.10 slopes with embankment height aver 24', use length for 24' embankment height from table + 2.24.
- For C-02.20 slopes with embankment height over 32, use length for 32 embankment height from table + 1.8.
- For C-02.30 slopes with embankment height over 13, use length for 13 embankment height from table + 1.8.
- 4. For spillway details, see Std C-04.10.



STATE OF ARIZONA Lery !! Otternes DEPARTMENT OF TRANSPORTATION 7/94 DIVISION OF HIGHWAYS STANDARD DRAWINGS C-04.30 SPILLWAY LENGTH TABLE

	DESTRIF 104	COMMISSIONS	 MALE B.	CATE
REISSLE STD			PNB	7794
1				
fi .			 	

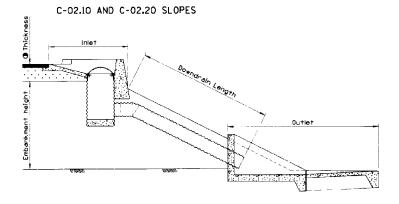
									LE	NGT	H C)F (OOW	NDF	11AF	4										
hi cknes	s									Emb	ankı	ment	Hei	ght												
•	71	8	9.	10'	111	12	13'	14'	15'	16'	17'	18	19'	20'	21'	22'	23'	24'	25'	26'	27	28,	29	30,	311	32
12"	32	38'	46	46'	46'	46'	48'	48'	48'	50	50'	50'	50	52'	52'	521	52'	54'	54'	54'	54'	56'	56,	56'	56'	58
13°	32	40'	46'	46'	48'	48'	48'	48'	50'	50'	50'	50'	52'	52'	52'	52'	54'	54'	54'	541	56'	56'	56'	56'	58'	58
14*	34'	40'	46	46'	48'	48	50'	50'	50'	50	50'	52'	521	52'	52'	54'	54'	54'	54'	56'	56'	56'	56	58'	58'	58
15*	34	40'	46'	46'	48'	48'	50'	50'	50'	50	52	52'	52'	52'	54'	54'	54	54"	56'	56'	56	56	56'	58'	58'	60
16"	34	40	48'	48'	48	48	50'	50'	50'	52	52.	52'	521	54'	54'	54'	54	56	56	56'	56	58	58'	58'	60'	60
17*	34	42'	48'	48	50'	50'	50,	50°	521	52	521	52'	54'	54'	54	54'	56'	56,	56	56'	58'	581	581	60,	60'	60
18"	36	42'	48'	48'	50'	50'	52'	52'	52'	52	52'	54'	54	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60,	60'	60
19*	36'	421	48'	48'	50'	50'	52'	52'	52'	52	54'	54'	541	54'	56'	56	56	56'	58'	58'	58'	58'	60'	60,	60'	62
20*	36,	42'	50	50'	50'	50'	52'	52'	52'	54	54'	54'	54'	56'	56'	56,	56'	58	58'	58'	58'	60'	60'	60'	62'	62
21"	36'	44'	50'	50'	52'	52'	52'	52'	54'	54	541	54'	56'	56'	56'	56'	58	58'	58	58'	60'	60'	60'	62'	62'	62
22"	381	44	50	50	52'	52	54'	541	54'	54'	54'	56'	56'	56'	56'	56'	58'	58	58.	60,	60,	60,	62'	62'	621	62
23"	381	44'	50	50'	52'	521	54'	54'	54'	54'	56'	56'	56'	56.	58'	58'	58'	58'	60,	60'	60'	60'	62'	62'	62'	64
24"	381	44'	52'	52'	52	52'	54	54'	54	56	56	56'	56'	58'	58'	58'	58	60,	60'	60'	60,	62'	62	62	64	64
25"	381	46'	52'	52'	54	54	54'	54'	56'	56'	56'	56'	58	58'	58	58	60	60.	60,	60,	62'	62'	62.	64'	64	64
26.	40'	46'	52'	52'	54.	54	56	56	56	56'	56	58	581	58	58'	60'	60	60.	60'	62.	62'	62'	64'	641	64	64
27.	40'	46'	52'	52'	54'	54'	56'	56	56'	56	58	58'	58	58'	60,	60,	60.	62'	62'	62'	62'	64	64'	64'	64'	66
28*	40'	46	54	54'	54'	541	56'	56	58'	58'	581	58'	60,	60,	60,	60'	60,	62'	62'	62'	64	64	64'	64'	66'	66
29"	40'	481	54'	54'	56'	56'	56'	56	58'	58'	58'	58'	60,	60,	60,	60,	62'	62,	62'	62'	64	64'	64'	66'	66'	66
30"	42'	48'	54'	54'	56'	56'	58'	58'	58'	58'	58'	60.	60,	60'	60,	62'	62	62'	62'	64'	64'	64'	66'	66'	66'	66
31*	42'	48'	54	54'	56	56'	58'	58	581	60,	60'	60'	60'	60'	62'	62.	621	64	64'	64'	64	66,	66'	66'	66'	68
32.	42'	48'	56'	561	56'	56'	58'	58	60,	60,	60'	60	62.	62'	62	62'	62	64'	64'	64'	66'	66'	66'	66	68'	68
33*	42	50'	56'	56'	58'	581	58'	60	60,	60,	60'	62'	62'	621	62'	54'	641	641	64'	66'	66.	66	56.	68	68'	68
34'	44'	50'	56'	56	58'	581	60'	60	60'	60'	62'	62'	62'	62'	64	64'	64	64'	66'	66'	66	66	68	68	68.	70
35°	44'	50'	58'	5B'	581	58	60,	60	60'	62	62'	62	62.	64	641	64'	641	66,	66	66'	66'	68	68'	68	70'	70
36*	44	50'	58	58	60,	60.	60,	60	621	62	62	62'	64	64	64	64	66	66	66	66	68	68'	681	68	70'	70

L	ENC	ТН	OF	DC	WN	DRA	IN		
Thickness			Emb	ankm	ent	Hei	ght		
•	5'	6'	7'	8'	9'	10'	11'	12'	13'
12"	14'	16'	16'	161	20'	20'	20'	20'	20'
13"	14'	16'	16'	18'	20'	20'	20'	20'	22'
14*	14'	16'	18'	18'	20'	50,	20'	20'	22'
15*	14'	18'	18	18.	50.	50,	20'	55.	55,
16"	16'	18'	18'	18'	201	201	22'	22'	22
17*	16,	18'	18'	18'	20'	22'	22'	22'	55,
18*	16'	18'	18'	18'	22'	55.	22'	22'	55,
19"	16'	18'	18'	20'	22'	22'	22'	22'	24'
20*	16'	18	20'	20'	22'	221	22'	24'	24'
21"	16'	20'	20'	20'	55,	22'	24	24	24'
22*	18'	20'	20'	20'	22'	22'	24	24'	24'
53.	18.	20'	20'	20'	55.	24'	24	24	24
24"	18	50.	50.	20'	24	24'	24	24.	26
25"	18'	20'	20'	22'	24'	24'	24	24'	26'
26*	18'	50,	22'	55,	24'	24'	24'	26'	26'
27*	18'	22'	22.	22'	24	24'	26	26'	26'
28"	20'	22'	22'	22'	24	26'	26'	26'	26'
29*	50,	22'	22'	22'	26'	26'	26'	26'	26'
30"	20'	22'	22'	24'	26	26'	26	26'	28'
31"	20'	22'	24'	24'	26	26'	26'	28	28'
32"	20'	24'	24'	24'	26'	26'	26	28'	28'
33.	22'	24'	24'	24'	26'	26'	28	28'	28'
34*	22'	24'	24'	24'	26'	28'	28'	28'	28'
35*	22.	24'	24	24'	28	28.	28	28'	28
36"	22'	24'	24'	26'	28'	28'	28	28'	30'

C-02.30 SLOPES

GENERAL NOTES

- For C-02.10 slopes with embankment height over 24, use length for 24 embankment height from table + 2.24.
- For C-02.20 slopes with embankment height over 32', use length for 32' embankment height from table + 1.8.
- For C-02.30 slopes with embankment height over 13', use length for 13' embankment height from table +1.8.
- 4. For downdrain details, see Std C-04.20.



OCSION APPROVED

STATE OF ARIZONA

THUMH OTHERS

DEPARTMENT OF TRANSPORTATION

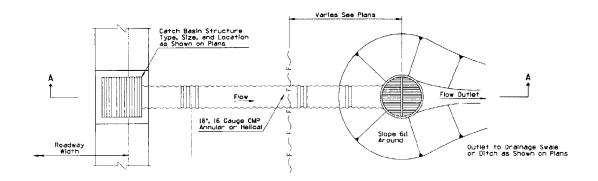
DIVISION OF HICHWAYS

STANDARD DRAWINGS

DEVANCE NO.

DE

10	DESCRIPTION OF HEVISIONS	WADE 6"	DATE
- 01	REISSUE STD	PNB	7/94
2		1	
- 31			
			•



Toe of Embankment Slope - See Plans Std C-15.91 Channel Invert Length as Required Subgrade Hinge Point VAVAVA) Frame & Grate See Std C-18.20 36" Fill Slope 0.02 //1 .02 % 12" Stub/ Invert Elevation See Plans Corrugated Metal Pipe Prefabricated Tee, Steel Annular 16 Ga 18"x36"x72" 6" Class B Concrete

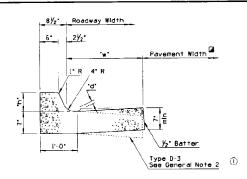
SECTION A-A

PLAN

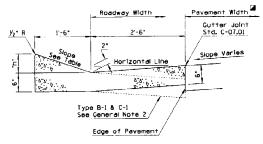
- Stub shall have annular corrugation. Downdrain piping beyond stub may be either annular or helical.
- Couplings shall be mechanical heat-shrinkable polyolatin sheet; one piece lap type neoprene sheet or silp seam; all 12': min width and 18 ga min.
- Maximum O Allowable = 8 cfs Minimum V Allowable = 1 fps



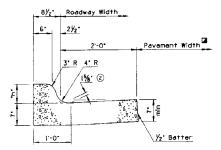




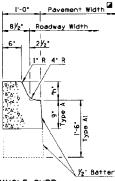
CURB AND GUTTER TYPE D, D-1, D-2 & D-3



CURB AND GUTTER
TYPE B, C, B-1 & C-1



CURB AND GUTTER TYPE G



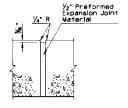
SIN	NGL:	Ε(CUF	₹В
TΥ	PΕ	A	&	A1

	C & G TYPE	CURB HEIGHT	SLOPE
	В	6.	3:1
	B-I	6"	3:1
ı	С	3.	6:1
	C-1	3-	6:l

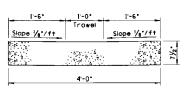
SINGLE CURB TYPE G

	C & G TYPE	CURB HEIGHT	GUTTER WIDTH	GUTTER DEPRESSION "d"
1	D	2	2'-0"	1% ②
	D-I	2	2'-6"	134. ③
	0-2	2	4'-6"	1¾. ②
	D-3		2'-0"	N/A

See Plans



EXPANSION JOINT DETAIL



VALLEY GUTTER

GENERAL NOTES

SINGLE CURB AND CURB AND GUTTER

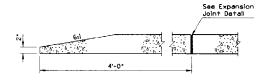
- Single curb, and curb and gutter may be constructed by the use of forms or the concrete may be extruded.
- When the pavement section slopes away from the gutter, the slope of the gutter shall match the pavement cross slope. Therefore, the gutter depression is not applicable.
- Two inch deep contraction joints shall be placed in the curb and the gutter at locations which match the joints in adjacent portland cement concrete pevement and at approximate 15 foot centers when adjacent to asphalfic concrete pevement, Joints shall be either hand tooled or sawed.
- Expansion joints shall be located at tangent points in curb returns, at structures and at maximum 60 foot intervals, The one-half inch joint filler shall extend the full depth at the concrete.
- Concrete shall be finished with a steel trowel followed by brushing with a fine brush along the length of the curb and gutter.
- All exposed edges and hand tooled joints shall be finished with a tool having a one-fourth inch radius unless a larger radius is indicated.

EMBANKMENT CURB

- No additional finishing will be required after extrusion or removal of the forms when the curb presents a neat appearance and the surface is uniform in texture and color.
- The curb shall conform to the cross section as shown except that the horizontal dimensions shall not vary more than one-half inch.

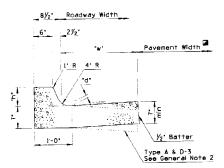


EMBANKMENT CURB



CURB TERMINAL SECTION

Lewy HOHEMAN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATI DIVISION OF HIGHWAYS STANDARD DRAWINGS		10/95
Konedle Allan	SINGLE CURB, CURB & GUTTER, EMBANKMENT CURB	DRAWING	но. С-05•10



CURB AND GUTTER TYPE A & D, D-1, D-2 & D-3

Roadway Width

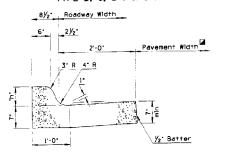
2.-6.

Horizontal Line

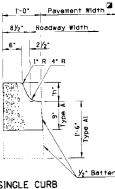


CURB AND GUTTER
TYPE B. C. B-1 & C-1

Type B-1 & C-1 See General Note 2, Edge of Pavement.



CURB AND GUTTER TYPE G



SINGLI	E C	URB	
TYPE	A 8	k Al	

C & G TYPE	CURB HEIGHT	SLOPE
В	6.	3:1
B-1	6.	3:1
С	3*	6:1
C-1	3.	6:1

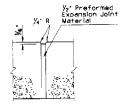
72

11-01	Pavement Width
8/2	Roadway Width
6-	2/2
\$ 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	3' R 4' R

SINGLE CURB TYPE G

C & G	CURB HEIGHT	GUTTER WIDTH	CUTTER DEPRESSION 'd'
Α	•	2'-0"	1*
D	2	2,-0.	2'
D-I	2	2,-6.	2.
D-2	2	4'-6"	2.
D-3	2	2'-0"	N/A

■ See Plans



① EXPANSION JOINT DETAIL

1'-6"	1'-0"	1-6-	
Slope 1/8 /ft	Trowel	Slope /8"/ft	
δ. σ. γ.	6 K	δ. φ. γ.	7%2
Me. tak	4'-0"		

VALLEY GUTTER

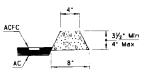
GENERAL NOTES

SINGLE CURB AND CURB AND GUTTER

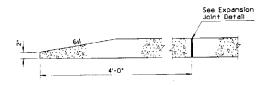
- Single curb, and curb and gutter may be constructed by the use of forms or the concrete may be extruded.
- When the pavement section slopes away from the gutter, the slope of the gutter shall match the pavement cross slope. Therefore, the gutter depression is not applicable.
- Two inch deep contraction joints shall be placed in the curb and the gutter at locations which match the joints in adjacent portland cement concrete payment and at approximate 15 foot centers when adjacent to asphaltic concrete pavement. Joints shall be either hand tooled or sawed.
- Expansion joints shall be located at tangent points in curb returns, at structures and at maximum 60 foot intervals. The one-half inch joint filter shall extend the full depth at the concrete.
- Concrete shall be finished with a steel trowel followed by brushing with a fine brush along the length of the curb and outter.
- All exposed edges and hand tooled joints shall be finished with a tool having a one-fourth inch radius unless a larger radius is indicated.

EMBANKMENT CURB

- 1. No additional finishing will be required after extrusion or removal of the forms when the curb presents a neat appearance and the surface is uniform in texture and color.
- The curb shall conform to the cross section as shown except that the horizontal dimensions shall not vary more than one-half inch.



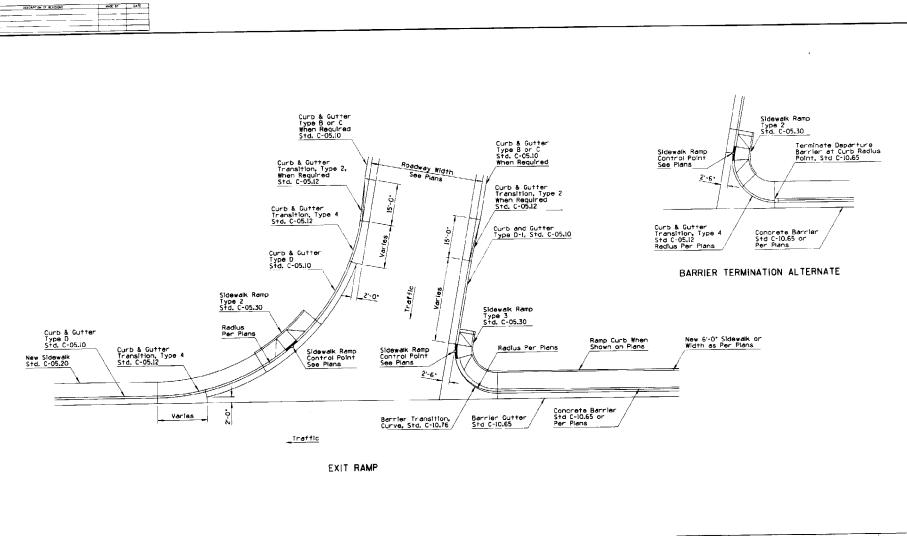
EMBANKMENT CURB



CURB TERMINAL SECTION

-	DESIGN APPROVED	STATE OF ARIZONA	REV.
4	Jany H. Ottermina	DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	7/94
1	APPROVED FOR	STANDARD DRAWINGS	
	Proced Challen	SINGLE CURB, CURB & GUTTER, EMBANKMENT CURB	C-05.10

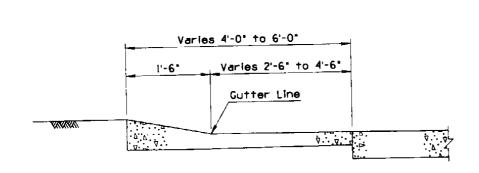
C-05.11 Sheet 1 of



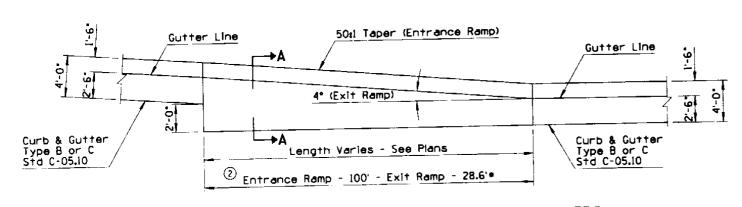
STATE OF ARIZONA

THE OFTEN STATE OFTE

HADE BY	DATE
4	1/94
8	7/94
#B	7/94
•	В



SECTION A-A



TYPE 1 - CURB & GUTTER TRANSITION - AT RAMP TAPERS

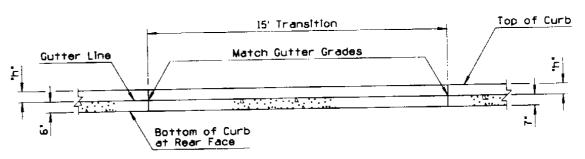
* Dimension may vary where exit occurs on curves, see plans

Gutter Line

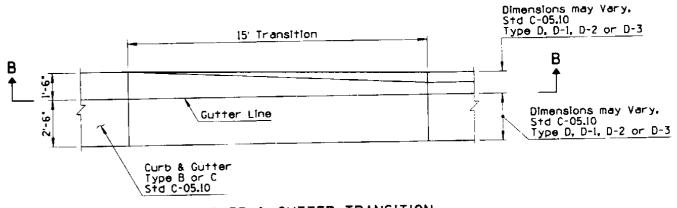
GENERAL NOTES

- i. All gutter flow lines shall be constructed to an accurate grade.
- See Slotted Drain Stds., C-13.60 and C-15.91, for curb and gutter with slotted drain.
 - See Std. C-05.10 for additional general notes and dimensions.

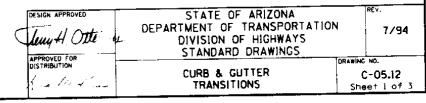
① PERSPECTIVE VIEW

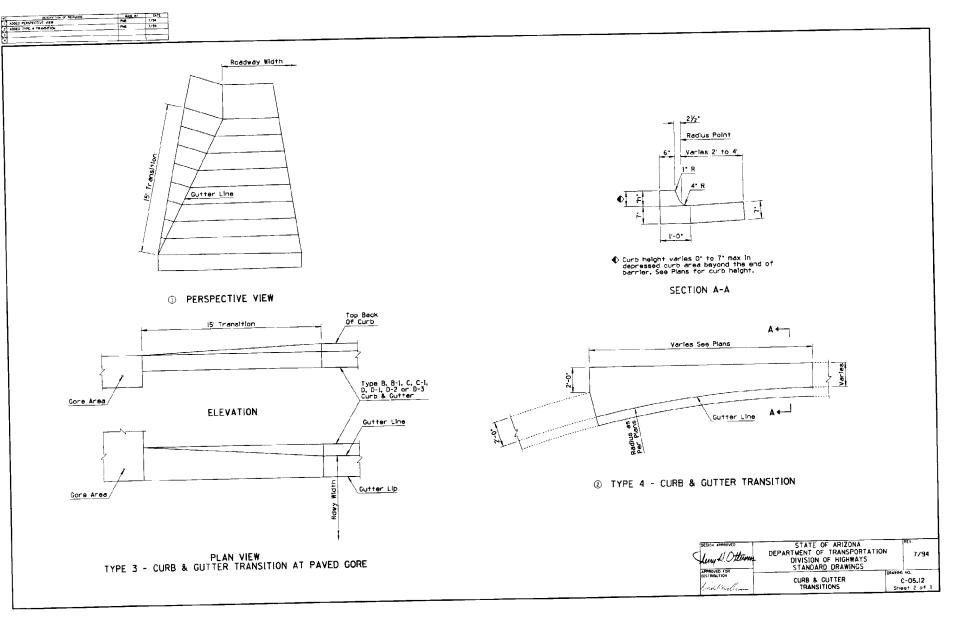


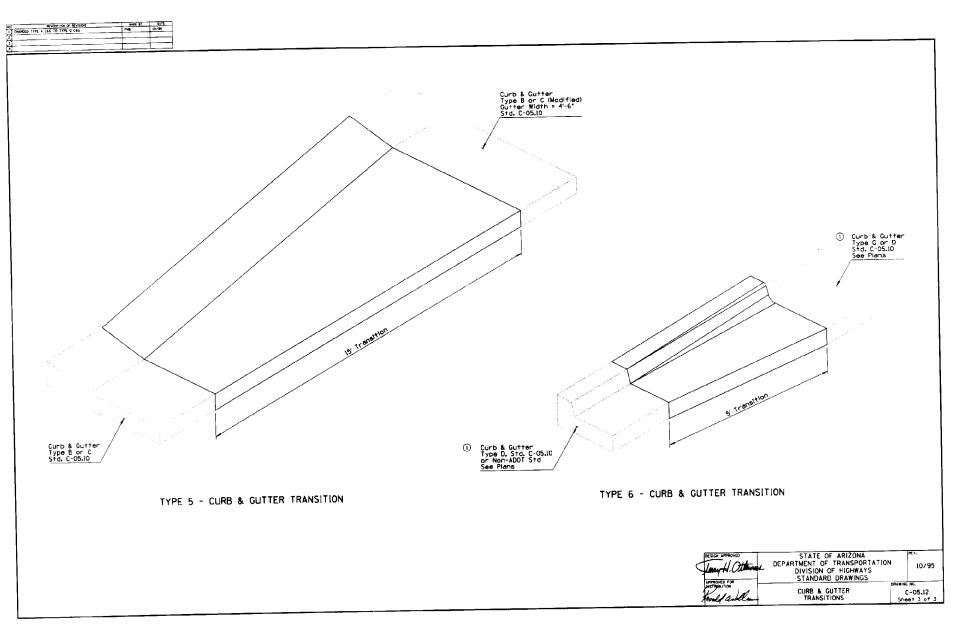
SECTION B-B

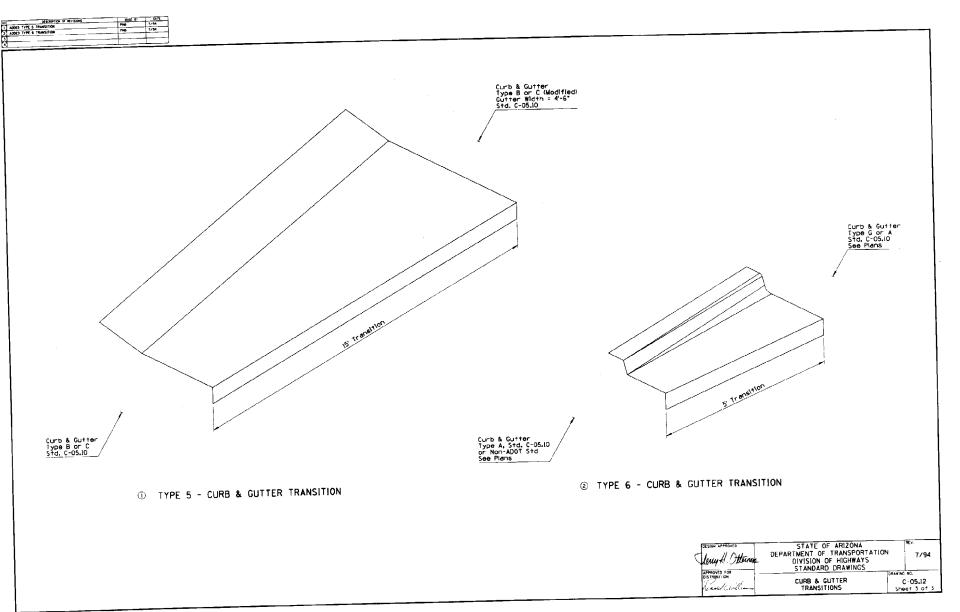


TYPE 2 - CURB & GUTTER TRANSITION

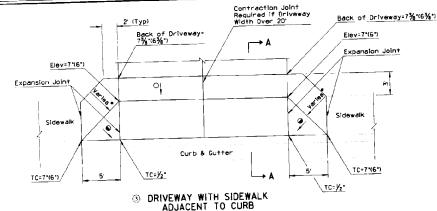


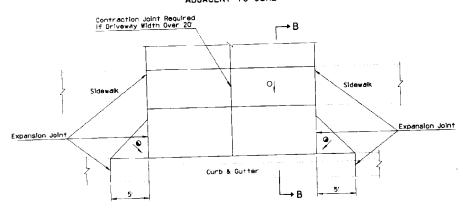












DRIVEWAY WITH SIDEWALK SETBACK



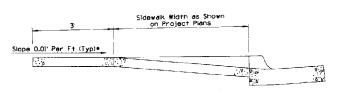
DEPRESSED CURB AT DRIVEWAY ENTRANCE

GENERAL NOTES

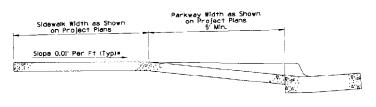
- 1. Unless otherwise specified, driveways shall be 6 inches in depth.
- 1 2. Two inch deep transverse contraction Joints shall be placed in driveways if the criveway width is over 20 feet. If the driveway thickness of greater than 6 inches, then the contraction joint shall be 1/3, where I is the thickness of the driveway, doints shall be either formed or saved, formed joints shall be first and on a value of the criveway. See shall be the contraction joint betain the contraction joint join
- Expension joints shall be located between driveways and sidewalks and all aburting structures. The one-half inch joint filler shall extend the full depth of the concrete. See sheet 2 of 2 for the Expension Joint Detail.
 - Concrete shall be finished by means of a float, then steel trowelled and then broomed with a fine brush in a transverse direction.
- (4) 5. Top of curb (TC) and driveway elevations shown are in relation to the gutter. Gutter=0".
- 4 6. When curb heights of 6° or less are shown on plans, use dimensions shown in (1's.
- (4) 7. When curb heights of 7° or more are shown on plans, see plans.

LEGEND

- O_ Cross slope (0.01' Per F+ (Typ))*
- Straight grade with downward slope.
- Maximum slope = 0.02' Per Ft.

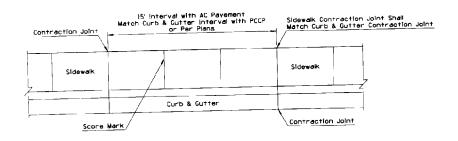


② SECTION A-A

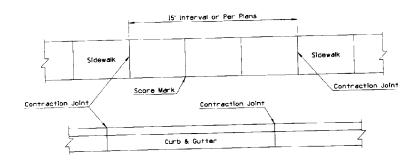


② SECTION B-B

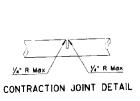
CESIGN APPROVED LEASELY Officery	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	^{₹EV.} 7/94
APPROVED FOR DISTRIBUTION	CONCRETE DRIVEWAYS & SIDEWALKS DRIVEWAYS	C-05.20 Sheet 1 of 2

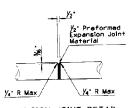


SIDEWALK ADJACENT TO CURB



SIDEWALK SETBACK FROM CURB





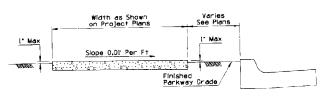
EXPANSION JOINT DETAIL

GENERAL NOTES

- 1. Unless otherwise specified, sidewalks shall be 4 inches in depth.
- 2. One Inch deep transverse contraction joints shall be placed in side-walks at intervals of approximately 15 feet or at a spacing that matches adjacent curb and gutter. If the sidewalk is over 7 feet in width, a 2 inch deep longitudinal contraction joint shall be placed in the center of the sidewalk. The maximum erea of sidewalk without contraction joints or scoring lines shall be approximately 36 square feet. Joints shall be aither formed or sawed, Formed joints shall be finished with a tool having a ¼ radius.
- 3. Expansion joints shall be located between sidewelks and driveways and all abutting structures. Expansion joints shall match the joints in the adjacent concrete pavement or existing concrete curb and sidewalk, Maximum length of sidewalk without an expansion joint shall be 60 transverse feet. The one-half inch joint filler shall extend the full depth of the concrete.
- Concrete shall be finished by means of a float, then steel trowelled and then broomed with a fine brush in a transverse direction.
- Sidewalks shall be constructed to a desirable width of 5 feet on major streets, a minimum width of 4 feet on residential streets or as shown on the plans.
- Scoring lines shall be ¼ inch in depth. They shall be placed at 5 foot spacing when the contraction joint interval is 15 feet and at 6 foot spacing when the contraction joint interval is 12 feet.

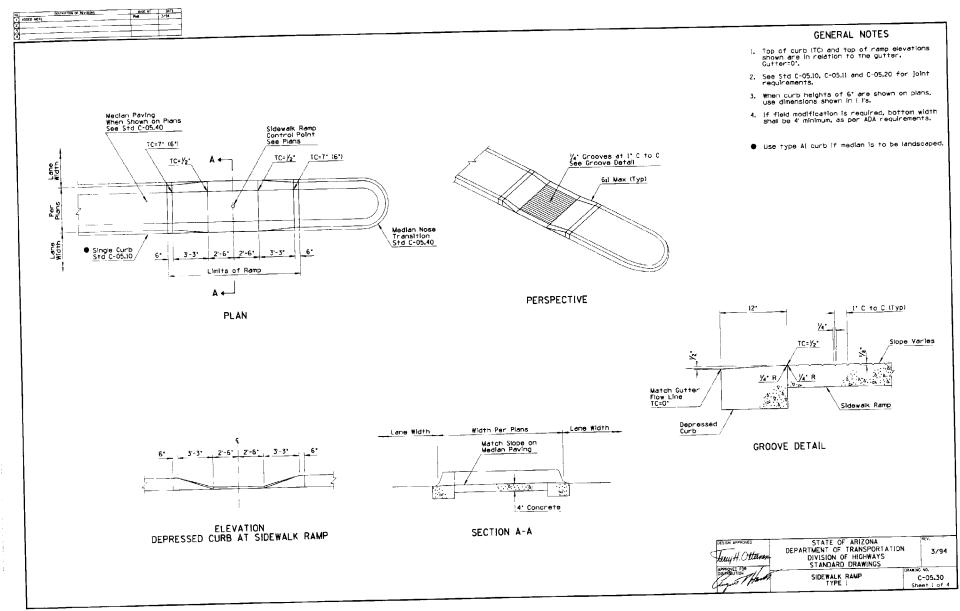


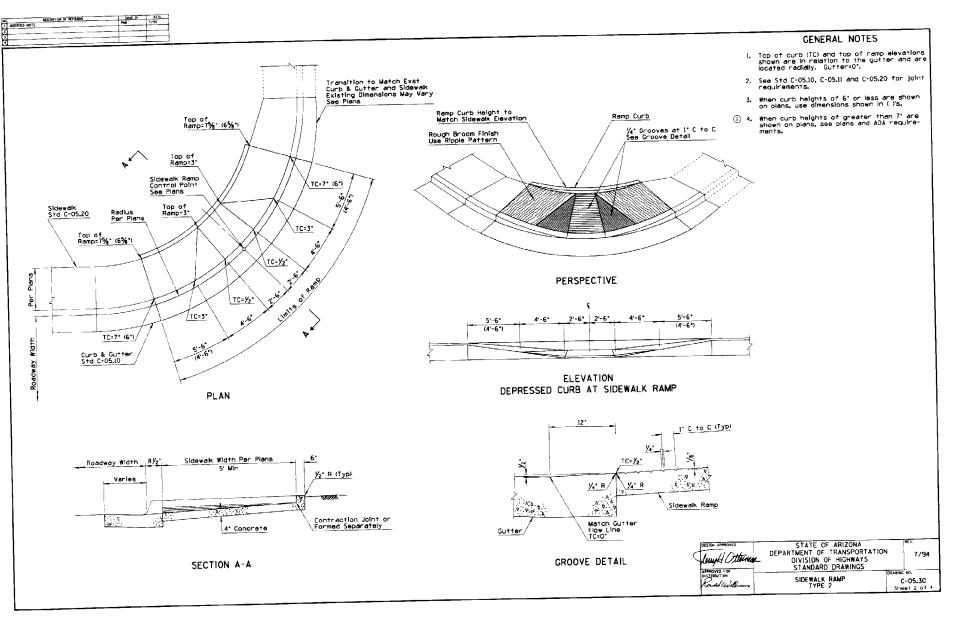
CONCRETE SIDEWALK ADJACENT TO CURB

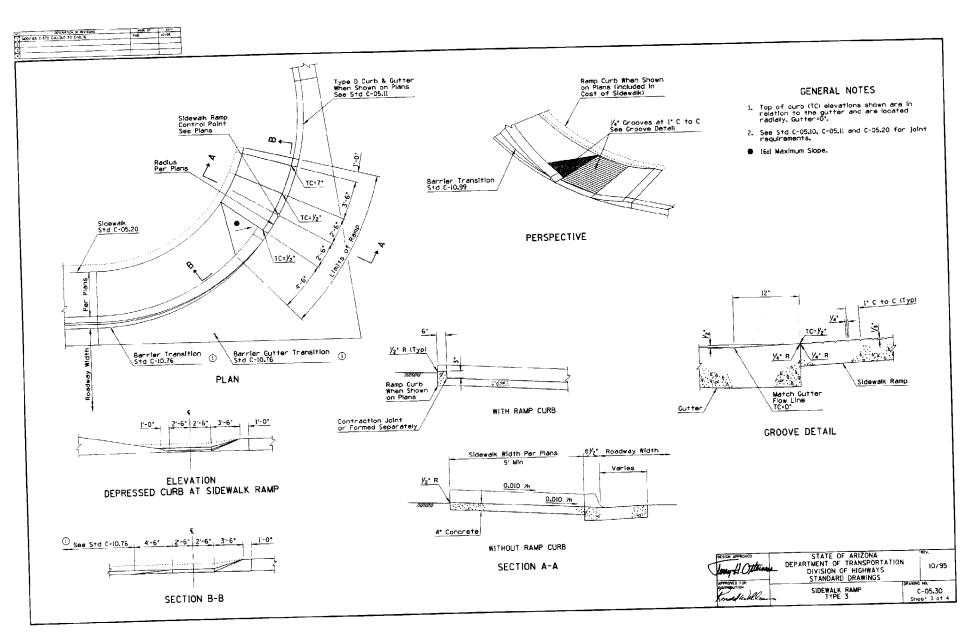


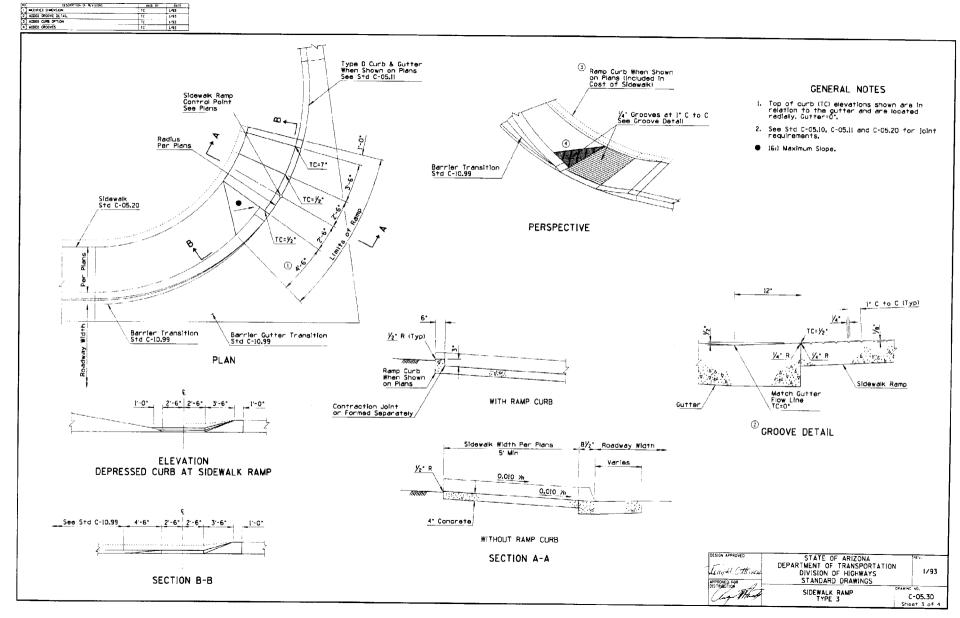
CONCRETE SIDEWALK SETBACK FROM CURB

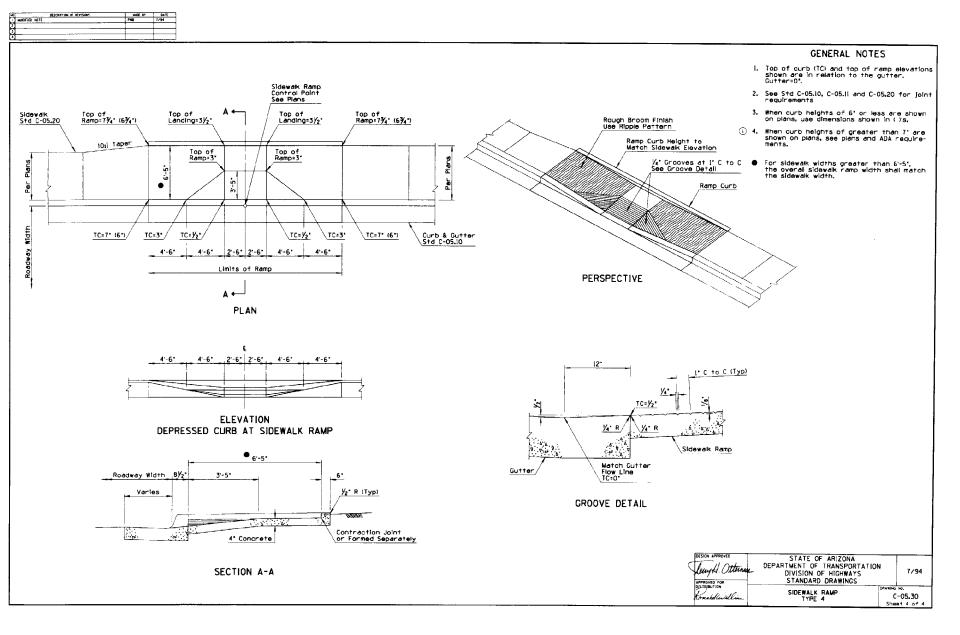




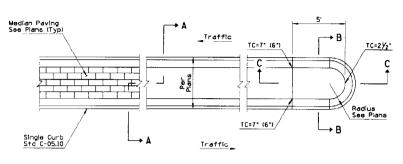




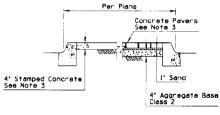




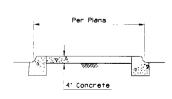




PLAN



SECTION A-A



TC=7' (6')

TC=2½*

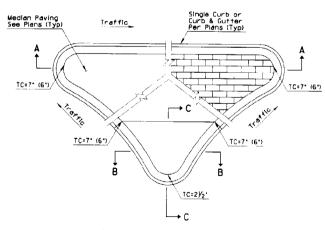
TC=0'

SECTION B-B

SECTION C-C

GENERAL NOTES

- Traffic signal foundations, traffic sign foundations and pull boxes for traffic signs and traffic signals shall be installed prior to placement of median paying.
- 2. See Std C-05.10, C-05.11 and C-05.20 for joint requirements.
- Decorative median paving shall be stamped concrete, concrete pavers or as specified on the project plans.
- Decorative median paving shall not be placed on a median nose transition or on a median island on a structure.
- A 4" x 6" concrete header shall be used to end decorative paying at locations when concrete sidewalk ramps are not present.
- Median nose transitions shall not be placed on departure ands of raised medians.
- 7. Top of curb (TC) and top of ramp elevations shown are in relation to the gutter. Gutter=0'.
- When curb heights of 6" are shown on plans, use dimensions shown in ()'s.
- $^{\scriptsize \textcircled{\scriptsize 1}}$ 9. See Structure Plans for raised median on structures,



NOSE TRANSITION LAYOUT

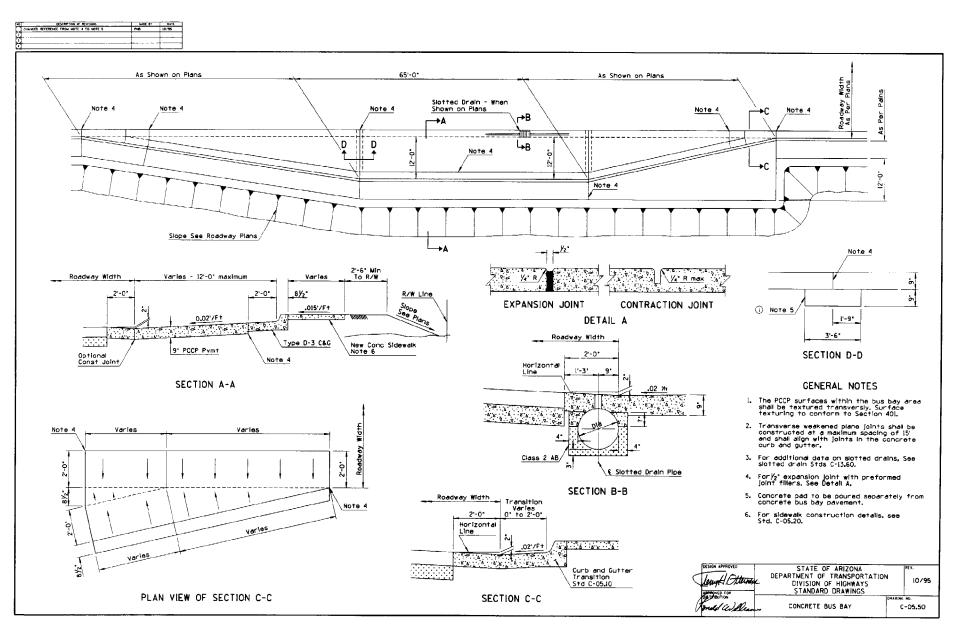
DESIGN APPROVED

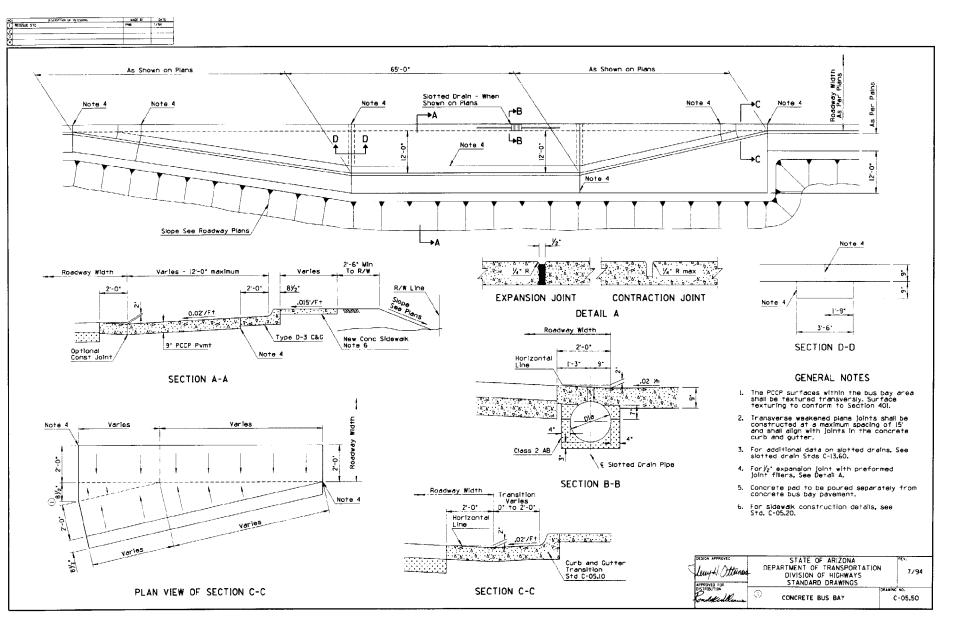
LIVE THE OF ARIZONA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS
STANDARD DRAWINGS

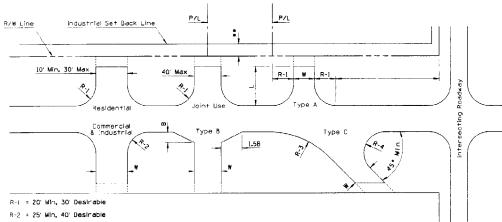
MEDIAN PAVING AND
NOSE TRANSITION

C-05.40









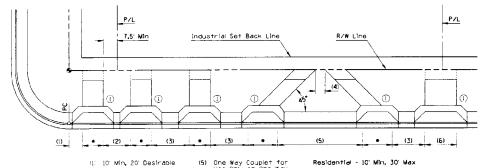
R-3 = 80'

R-4 = 20' Min

W = 25' Min. 40' Max

** - See Proper City or County Regulation

RURAL DEVELOPMENTS



- (2) 15' Min
- (3) 25' Min, 40' Desirable
- (4) 40° Min
- (5) One Way Couplet for Use Only on One Way Roadways
- (6) 40' Max Joint Use Driveways

Commercial - One Way: 15' Min, 30' Max Two Way: 25' Min, 40' Max

Industrial - 20' Min. 40' Max

URBAN DEVELOPMENTS

GENERAL NOTES

. Driveway types:

Residential - one providing access to a single family residence, to a duplex, or to an apartment building containing five or fewer dwelling units.

Commercial - one providing access to an office, retall or institutional building or to an apartment building having more than

Industrial - one directly serving a substantial number of truck move-ments to and from loading docks of an industrial facility, warehouse or truck terminal.

2. Joint use driveways may become desirable for landowners of adjacent properties to service both properties. If this is the case, only one of the two adjacent landowners need apply for the access permit, but a notorized written mutual agreement, signed by all parties invioved, must accompany the application form.

Driveways for high volume traffic generators shall be approved individually by Traffic Engineering section.

Driveways with curb returns in urban areas shall be installed only with the approval of Traffic Engineering section.

Driveways and depressed curbs shall be located as noted on plans or as directed by the Engineer,

6. Drainage structures shall be provided under driveways where necessary,

Dimensions indicated as minimum shall be avoided whenever possible in favor of those indicated as desirable.

8. The Type "A" turnout is the preferable turnout design. Type "B" and "C" shall only be used when absolutely necessary.

 Paved turnouts, plans notation, will be W X L, surface material, type and standard. Example: 20' X 30' ACTO, Type A, Std C-06.10. Show radius (R) graphically.

10. Construction of curb, gutter, sidewalk and drainage facilities in urban areas by the permittee along that portion of the highway frontage under permit application, may be a stipulation of the permit approval if there appears to be reasonable need.

II. Excavation or embankment for turnouts shall be included in quantities for main roadways.

12. Base material shall be the same as that shown for main roadway, unless otherwise noted.

13. Desirable sideslope rates for rural turnouts are 6:1.

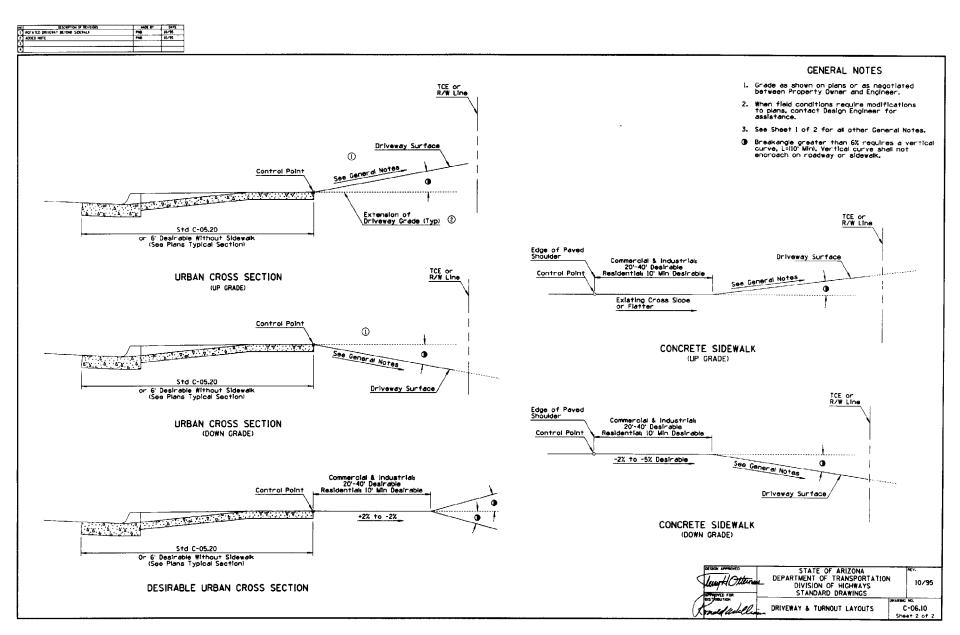
STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS

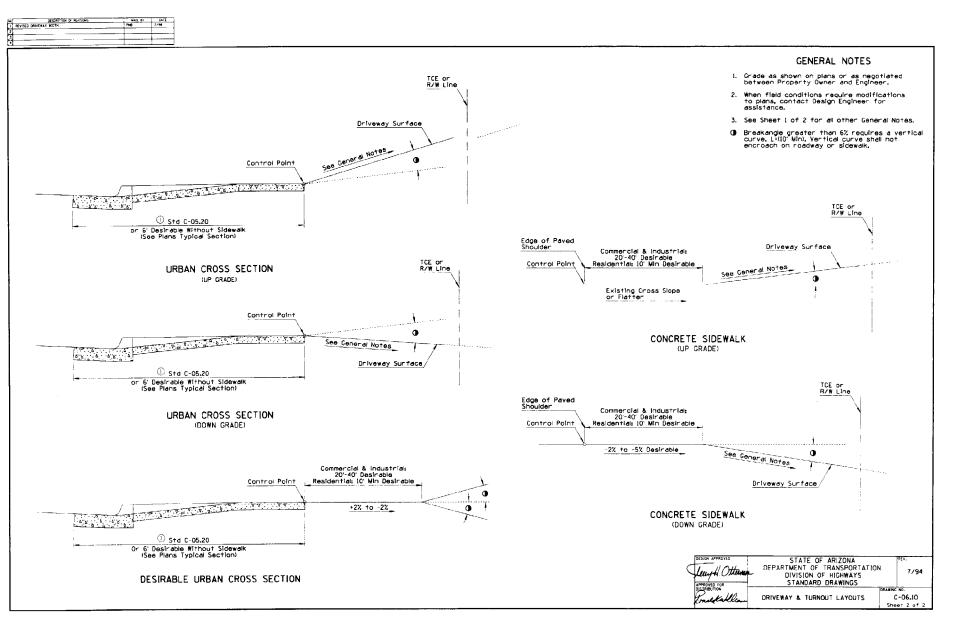
C-06.10

DRIVEWAY & TURNOUT LAYOUTS

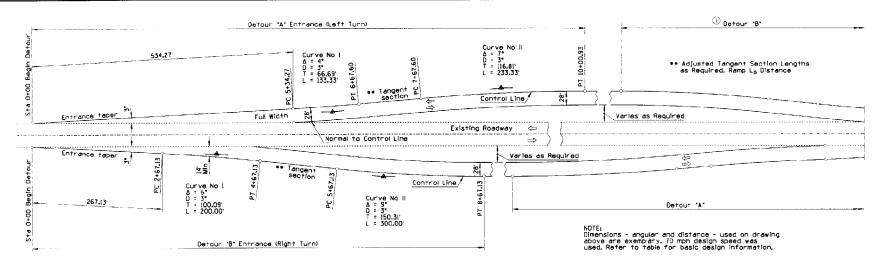
Sheet Lof 2

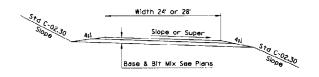
7/94











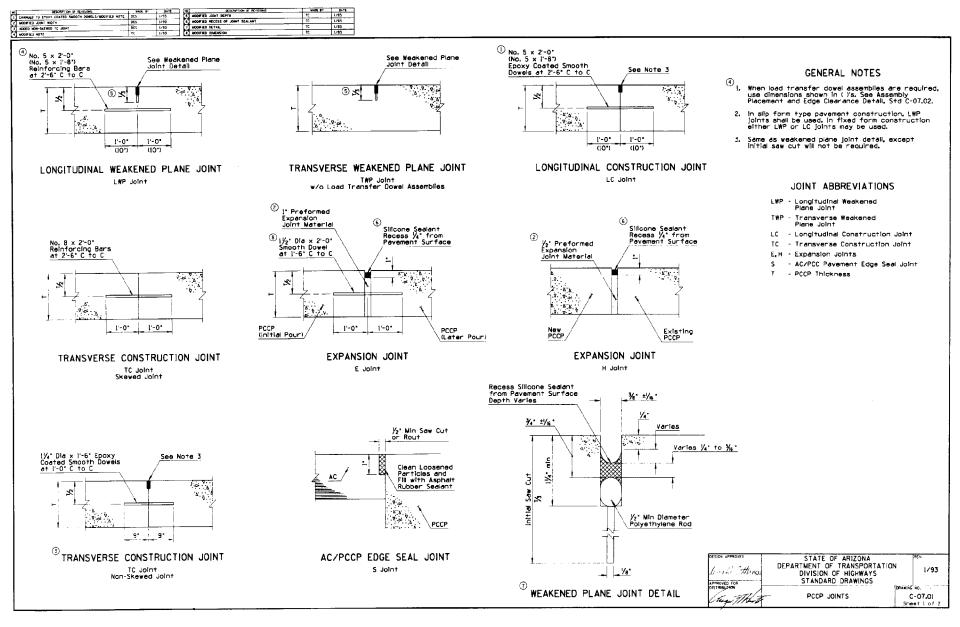
SPECIAL DETOUR SECTION

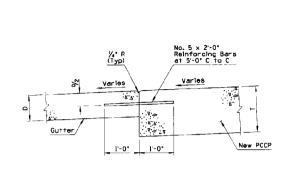
	GENT DWAY		CURVED ROADWAY	
Entrance Design Speed	Entr.Taper Def'l. Angle	Exist. Horiz. Curve	Detour "A" Take off Curve	Detour "B" Take off Curve
70	3*	1.	2°	2° 30'
60	3°	2°	3°	3° 30'
50	4.	3°	4°	5"
40	6.	4°	5*	6*
30	10*	5*	6*	7°
		6*	7*	8"
		7*	8*	9*
		В*	9°	10*

MAXIMUM	но	RIZONTAL	CU	RVATURE
Entrance Design	Curve No. I		Curve No. II*	
Speed	D	Superelev.	D	Superelev.
70	3°	.09'/ft.	3°	.06'/ft.
60	3*	.08'/ft.	4°	.05'/ft.
50	4*	.07'/ft.	6.	.05'/ft.
40	6°	.07'/ft.	10.	.05'/ft.
30	10°	.07/ft.	19*	.05'/ft.

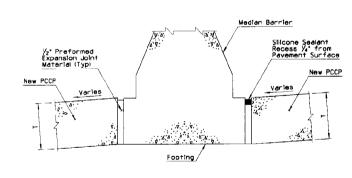
- Detour "A" entrance shall be used where an approaching vehicle must turn left. Detour "B" shall be used where an approaching vehicle must turn right.
- Detour from a horizontal curve: On the inside of the curve the detour take off shall be a curve, see table. On the outside a tangent take off shall be used. A vertical curve may be required to effect a smooth grade change.
- 3. The design speed shall be comparable between vertical and horizontal alignment.
- 4. The entrance design speed of a detour shall not be less than the normal posted speed of the existing roadway. The design speed for the remainder of the detour may be 20 mph less than the normal posted speed.
- 5. Any intermediate detour entrance may be designed on the basis of normal posted speed less 20 mph where visible construction activity has slowed traffic for the predecing V_4 mile.
- ② 6. The minimum width of the detour shall be 28' for existing roadway 34' or wider and a minimum of 24' for existing roadways less than 34' in width.
 - The entrance taper for Detour 'A' shall be extended until full detour width
 is attained. For Detour 'B' the entrance taper shall be extended until a
 minimum of 14' is attained beyond the edge of existing roadway.
 - Any deviation from this standard must be approved by the Plans Engineer and Traffic Engineer and the Engineer shall submit the alignment and profile of the proposed change for their review.
 - Native material used in constructing the detour embankment will be considerd suitable for backfill around pipe; however, it shall be reasonably free of rocks and debris.



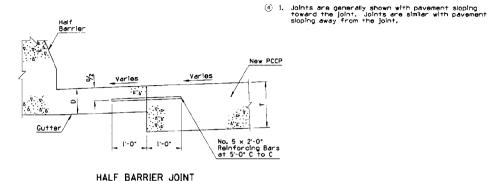




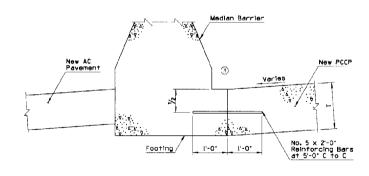
CURB & GUTTER JOINT G Joint



1 MEDIAN BARRIER JOINT B Joint PCCP On Both Sides of Barrier



B Joint



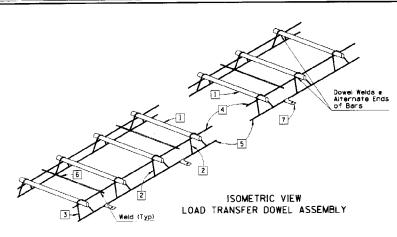
② MEDIAN BARRIER JOINT B Joint AC Pavement On Back Side of Barrier

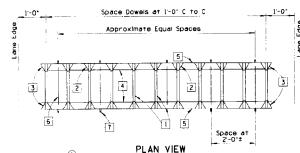
JOINT ABBREVIATIONS G - Gutter Joint

- T PCCP Thickness
- D Gutter Thickness
- B Barrier Joint

STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS PCCP JOINTS C-07.01 Sheet 2 of 2

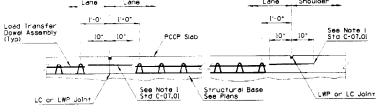
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LOAD TRANSFER DOWEL ASSEMBLY

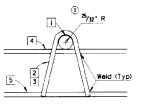
Lane Lane Shoulder



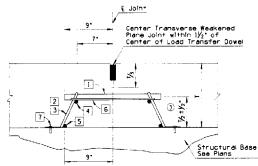
ASSEMBLY PLACEMENT AND EDGE CLEARANCE DETAIL

Structural Base

ANCHOR STRAP DETAIL



END AND INTERMEDIATE LEG DETAIL



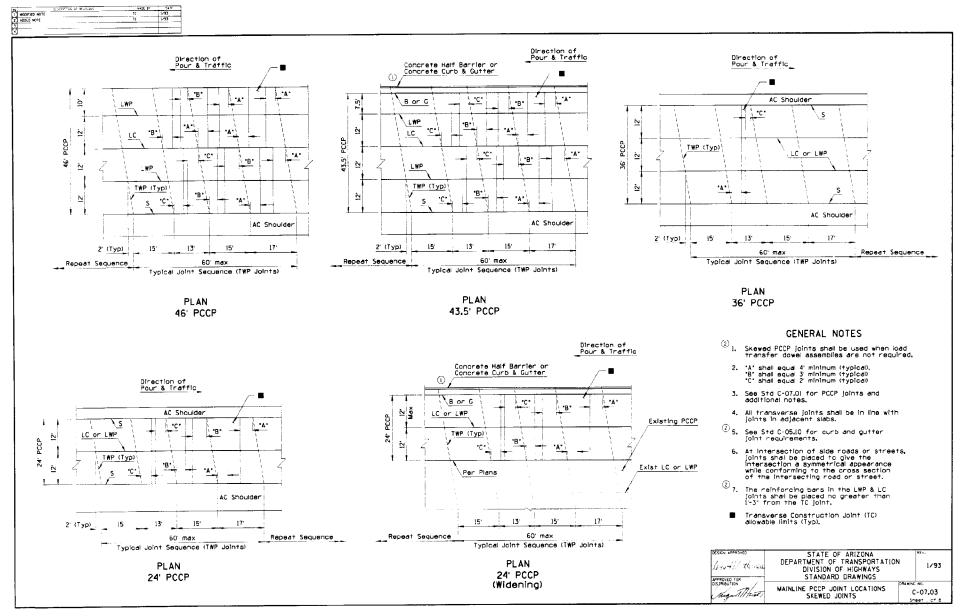
TRANSVERSE WEAKENED PLANE JOINT WITH LOAD TRANSFER DOWEL ASSEMBLY

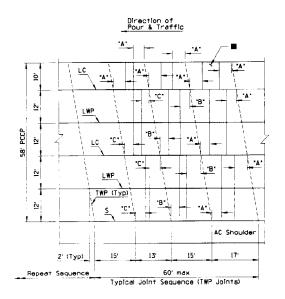
DIME	NSION	TABL	Ε
	L	ane Widt	th
	12'	14'	16'
•	10'-4"	12'-4"	[4'-4'

- Load transfer dowel assemblies shall be used with non-skewed PCCP joints.
- Load transfer dowel assemblies are to be placed at each transverse weakened plane Joint on the traveled lanes as shown on the plans.
- See Std C-07.01 thru C-07.05 for additional information.
- See plans or Std C-07.03 thru C-07.05 for transverse joint spacing.
- See plans for pavement thickness less than 12° or greater than 14°.
- Load transfer dowel assembly shall be assembled from the following materials.
 (See Quantity Table)
- 2 intermediate legs 2 Ga or W-5.5 wire.
- 3 End legs 2 Ga or W-5.5 wire.
- 4 Upper space bar 2 Ga or W-5.5 wire x (). (See Dimension Tabel)
- 5 Lower space bar 2 Ga or W-5.5 wire \times Φ . (See Dimension Table)
- 6 Tie bars W-1.5 wire x 16".
- 7] Anchor straps 1'x3' steel strap, 0.079 thick, Place with 1-1/2" min steel nail for LCB, 4" min steel nail for ACB or AB, 0.145 dia ASTM A227 Class I w/1/4" head or washer to be gower driven.

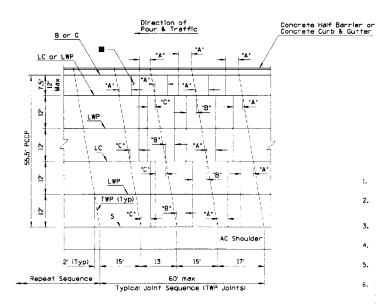
2				
	QUA	YTITM	TABL	Ε
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	2	18	22	26
	3	4	4	4
	4	2	2	2
	. 5	2	2	2
	6	5	6	7
	7	10	12	14

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PLAN 58' PCCP

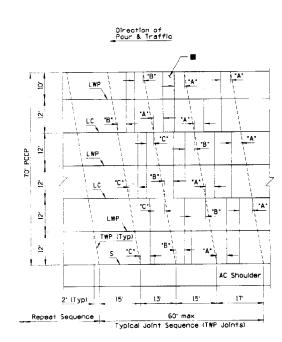


PLAN 55.5' PCCP

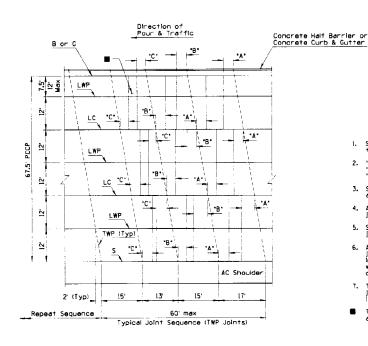
- Skewed PCCP joints shall be used when load transfer dowel assemblies are not required.
- 2. "A" shall equal 4' minimum (typical).
 "B" shall equal 3' minimum (typical)
 "C" shall equal 2' minimum (typical)
- See Std C-07.01 for PCCP joints and additional notes.
- All transverse joints shall be in line with joints in adjacent slabs.
- See Std C-05.10 for curb and gutter Joint requirements.
- At Intersection of side roads or streets, Joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
- The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3' from the TC joint.
- Transverse Construction Joint (TC) allowable limits (Typ).

DESIGN APPROVED	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	1/93
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PLAN 70' PCCP



PLAN 67.5' PCCP

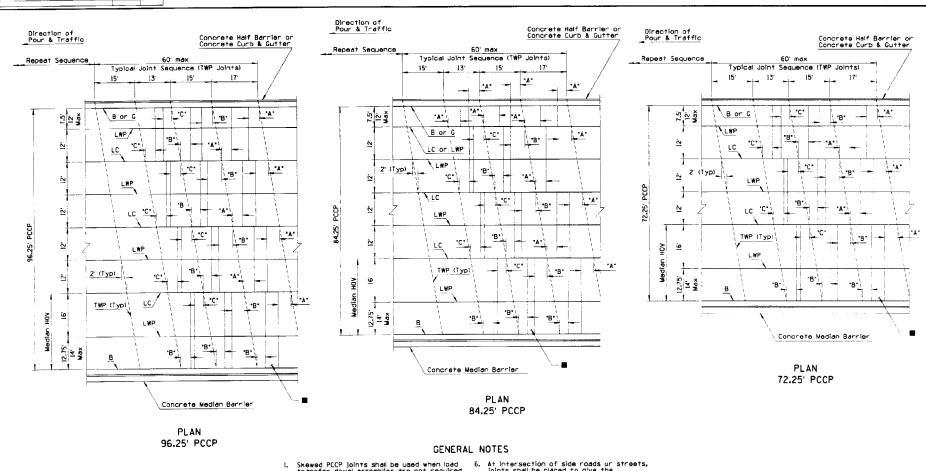
- Skewed PCCP joints shall be used when load transfer dowel assemblies are not required.
- 'A' shall equal 4' minimum (typical).
 'B' shall equal 3' minimum (typical)
 'C' shall equal 2' minimum (typical)
- See Std C-07.01 for PCCP Joints and additional notes.
- All transverse joints shall be in line with joints in adjacent slabs.
- See Std C-05.lO for curb and gutter joint requirements.
- At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
- The reinforcing bars in the LWP & LC joints shall be placed no greater than i'-3" from the TC joint.
- Transverse Construction Joint (TC) allowable imits (Typ).

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MAINLINE PCCP JOINT LOCATIONS
SKEWED JOINTS

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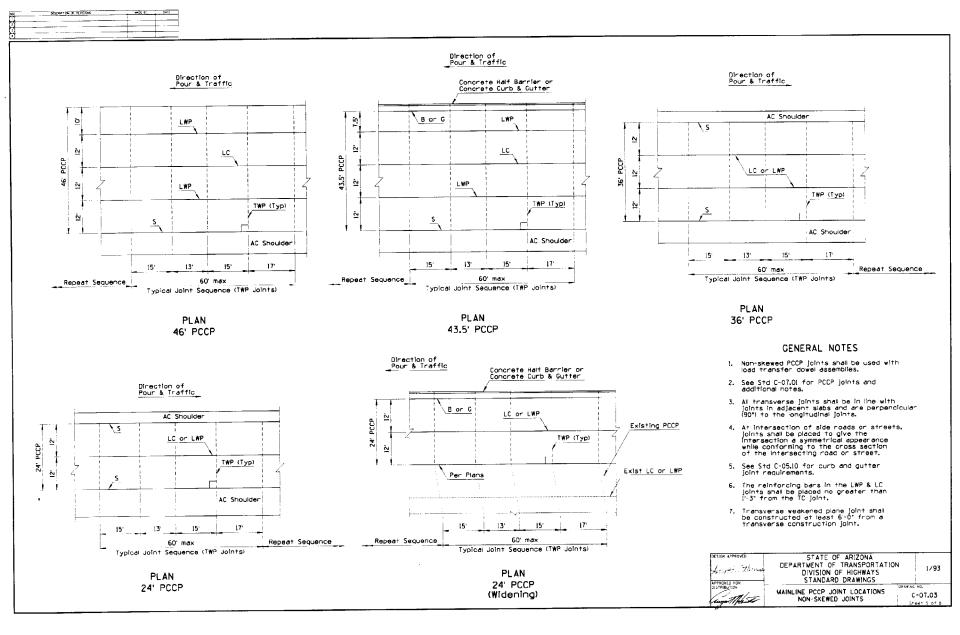


- transfer dowel assemblies are not required.
- 'A' shall equal 4' minimum (typical).
 'B' shall equal 3' minimum (typical)
 'C' shall equal 2' minimum (typical)

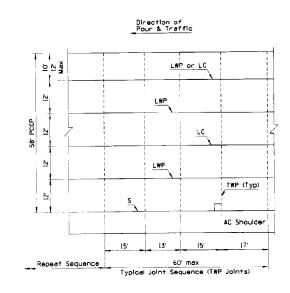
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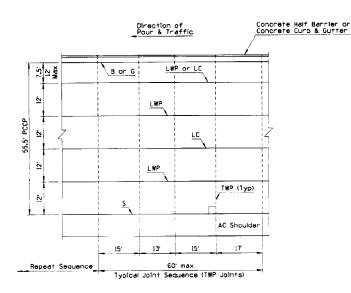
- See Std C-07.01 for PCCP joints and additional notes.
- All transverse joints shall be in line with joints in adjacent slabs.
- 5. See Std C-05.10 for curb and gutter joint requirements.
- joints shall be placed to give the Intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
- The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3' from the TC joint.
- Transverse Construction Joint (TC) allowable limits (Typ).

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PLAN 58' PCCP

PLAN 55.5' PCCP

GENERAL NOTES

- Non-skewed PCCP joints shall be used with load transfer dowel assemblies.
- 2. See Std C-07.01 for PCCP joints and additional notes.
- All transverse joints shall be in line with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.
- At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
- See Std C-05.10 for curb and gutter joint requirements.
- The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3' from the TC joint.
- Transverse weakened plane joint shall be constructed at least 6'-0' from a transverse construction joint.

DEFINATION APPROVED FOR DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS

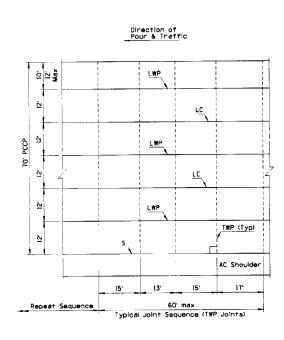
APPROVED FOR DISTRIBUTION NON-SKEWED JOINTS

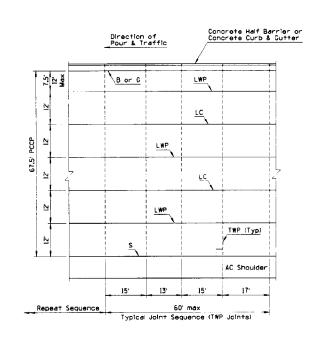
TOTAL OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS

MAINLINE PCCP JOINT LOCATIONS NON-SKEWED JOINTS

Sheet 6 of 8







PLAN 70' PCCP

PLAN 67.5' PCCP

- Non-skewed PCCP joints shall be used with load transfer dowel assemblies.
- See Std C-07.01 for PCCP joints and additional notes.
- All transverse joints shall be in line with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.
- At intersection of side roads or streets, Joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
- 5. See Std C-05.10 for curb and gutter joint requirements.
- The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint,
- Transverse weakened plane joint shall be constructed at least 6'-0' from a transverse construction joint.

DESIGN APPROVED

STATE OF ARIZONA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

THE PROPERTY OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

THE PROPERTY OF TRANSPORTATION

MAINLINE PCCP JOINT LOCATIONS

THE PROPERTY OF TRANSPORTATION

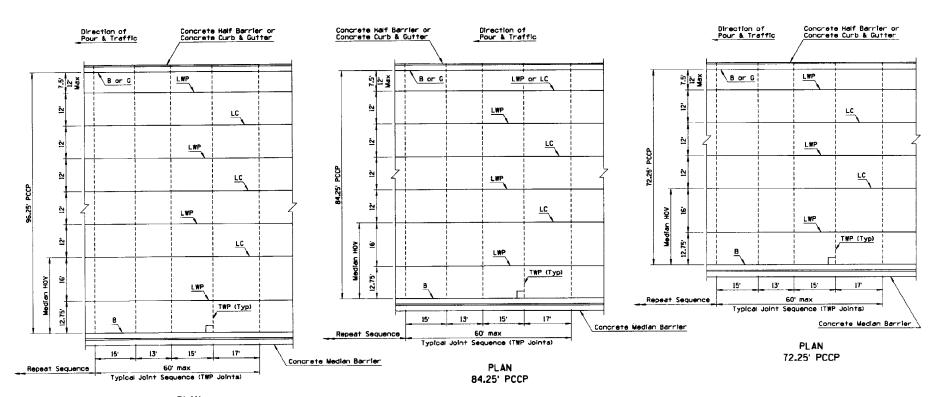
THE PROPERTY OF

NON-SKEWED JOINTS

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C-07.03

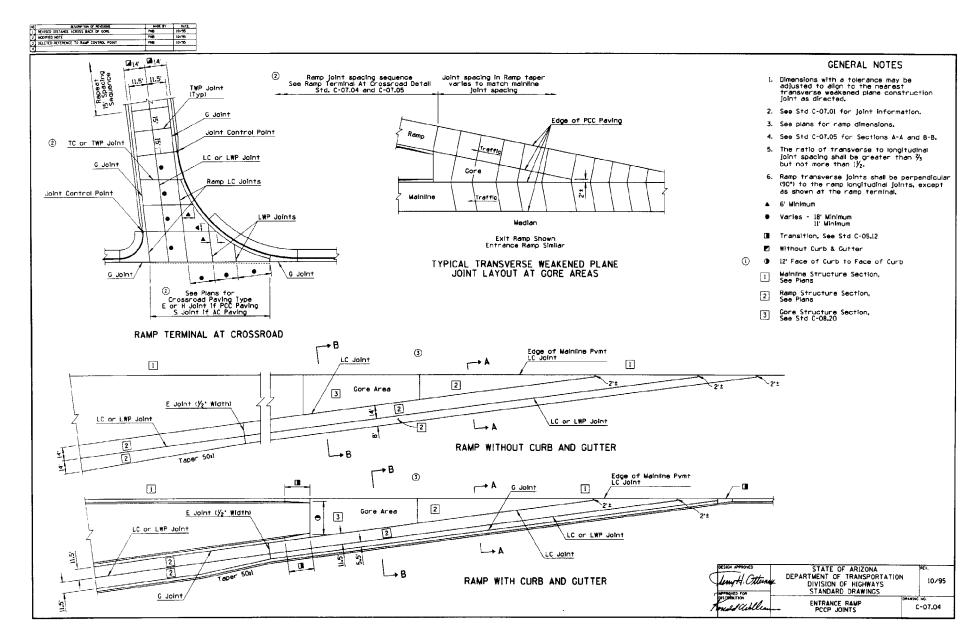
Sheet 7 of 8

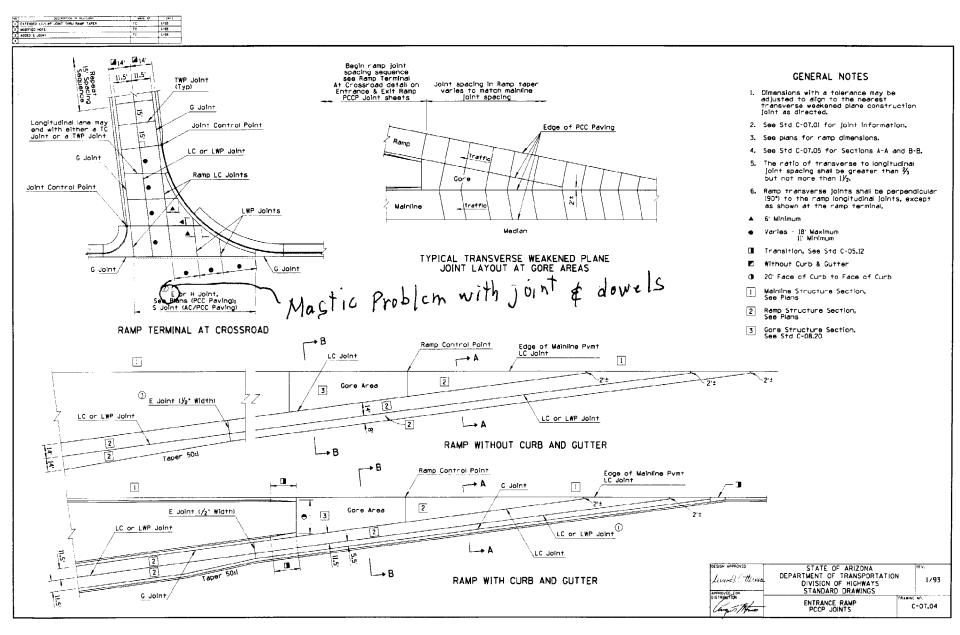


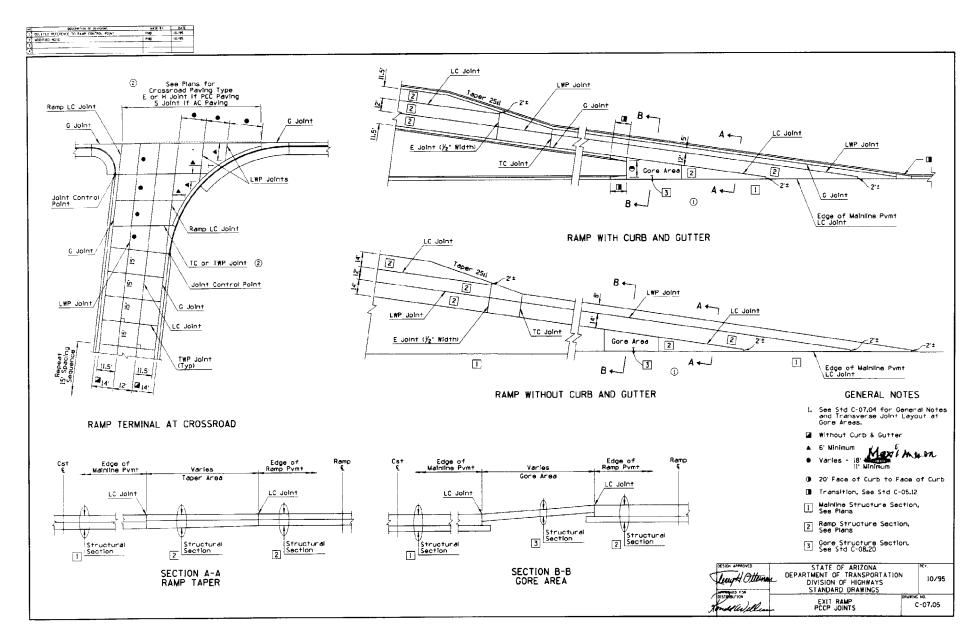
PLAN 96.25' PCCP

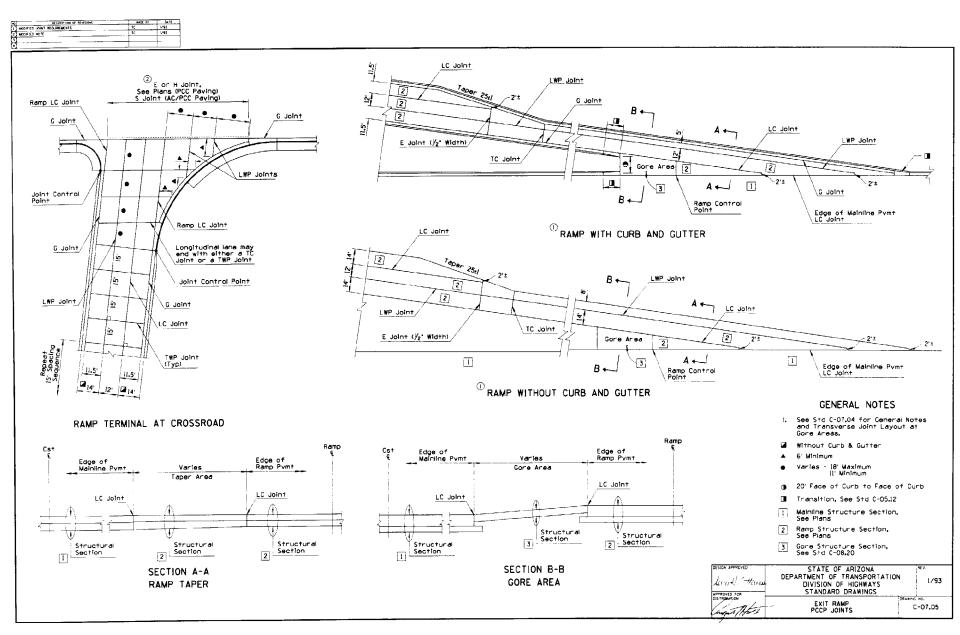
- Non-skewed PCCP joints shall be used with load transfer dowel assembles.
- See Std C-07.01 for PCCP Joints and additional notes.
- All transverse joints shall be in line with joints in adjacent slabs and are perpendicular (90*) to the longitudinal joints.
- At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
- See Std C-05.10 for curb and gutter joint requirements.
- The reinforcing bars in the LWP & LC joints shall be placed no greater than !-3" from the TC joint.
- Transverse weakened plane joint shall be constructed at least 6'-0" from a transverse construction joint.

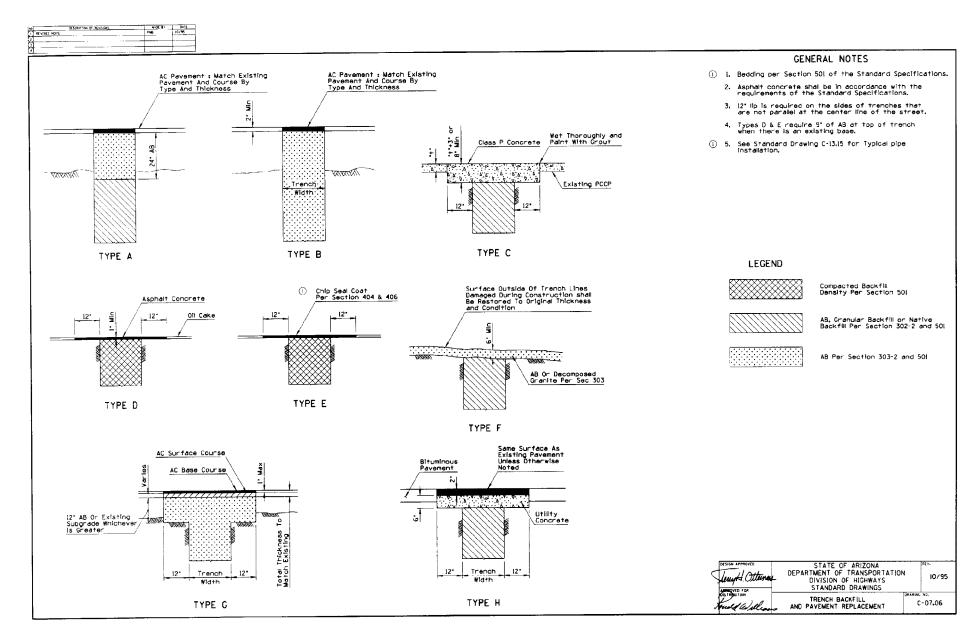
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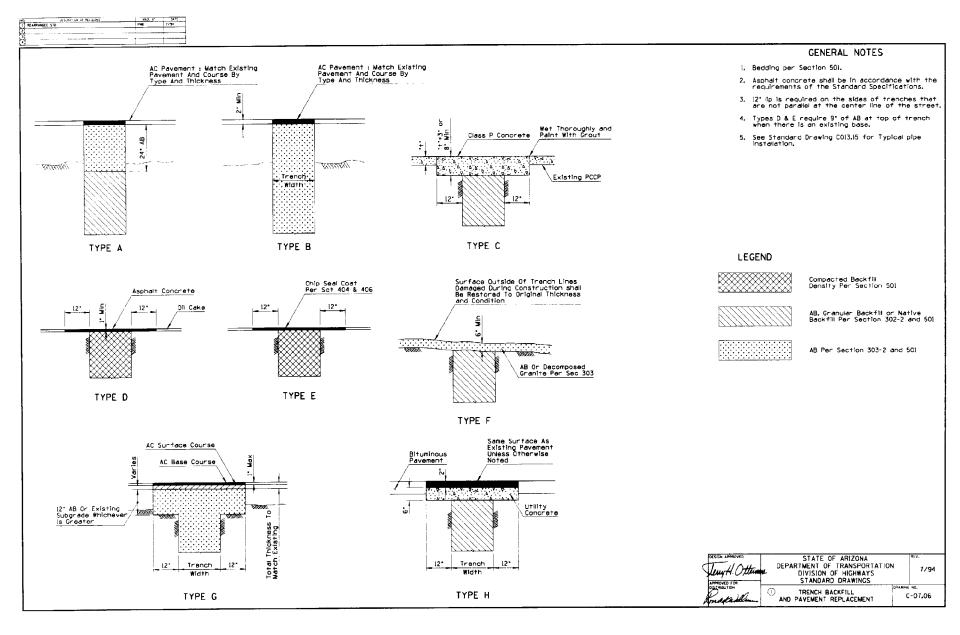




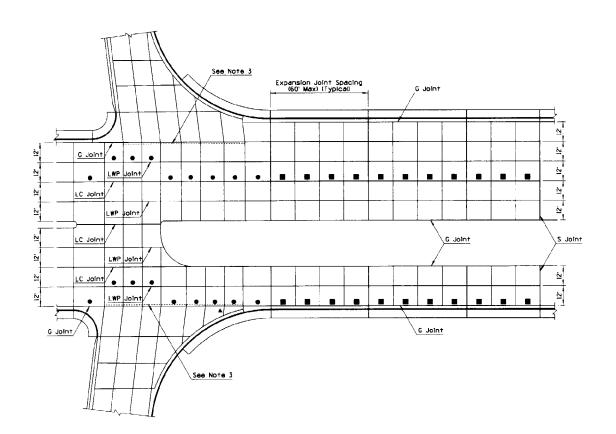






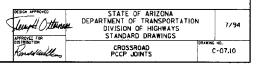


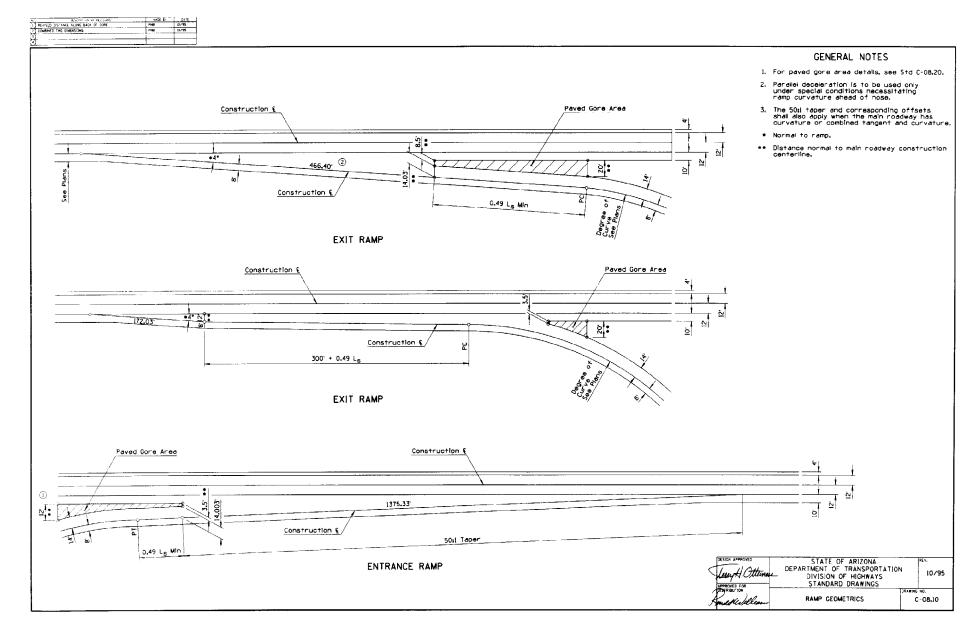
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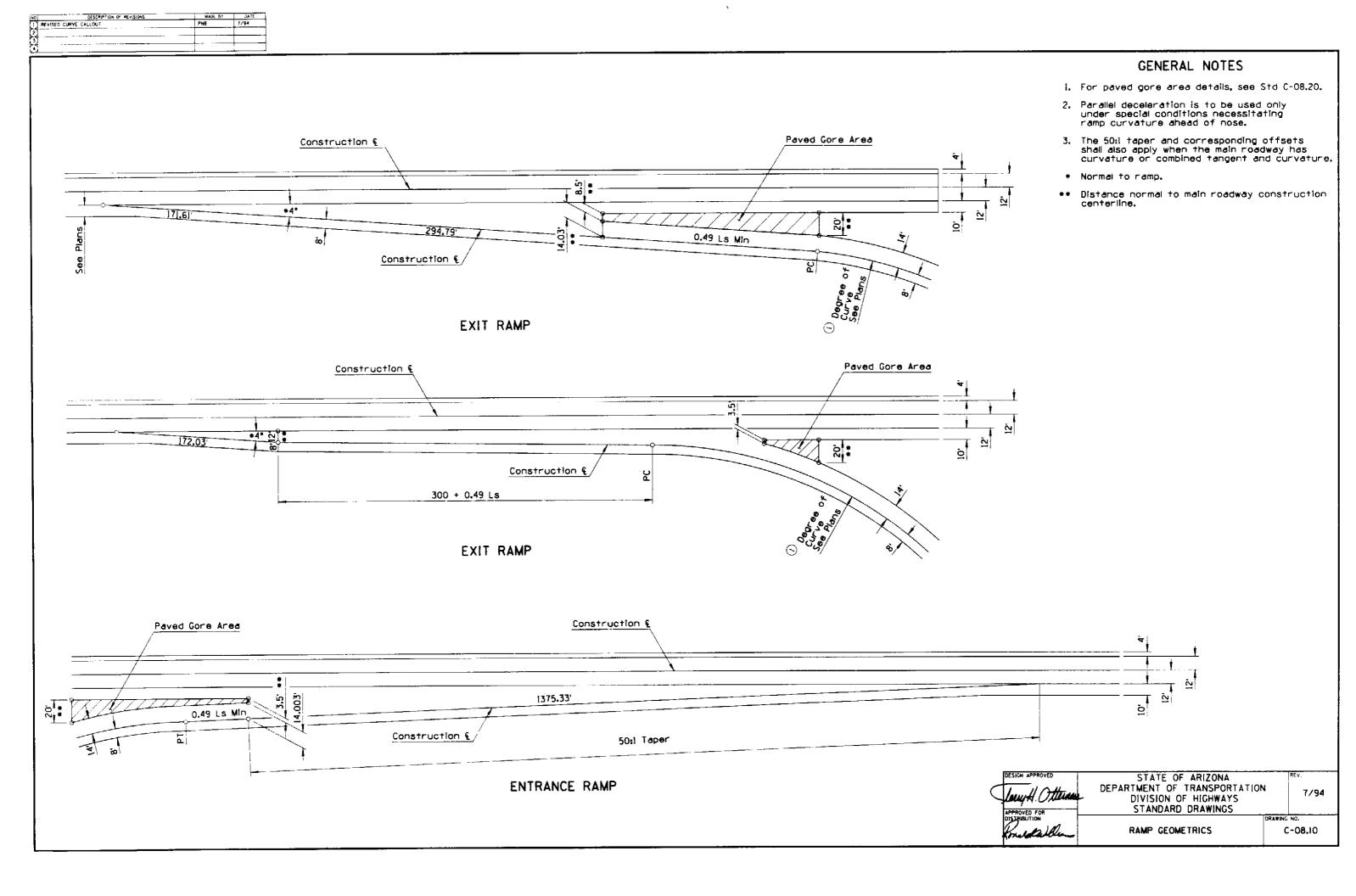


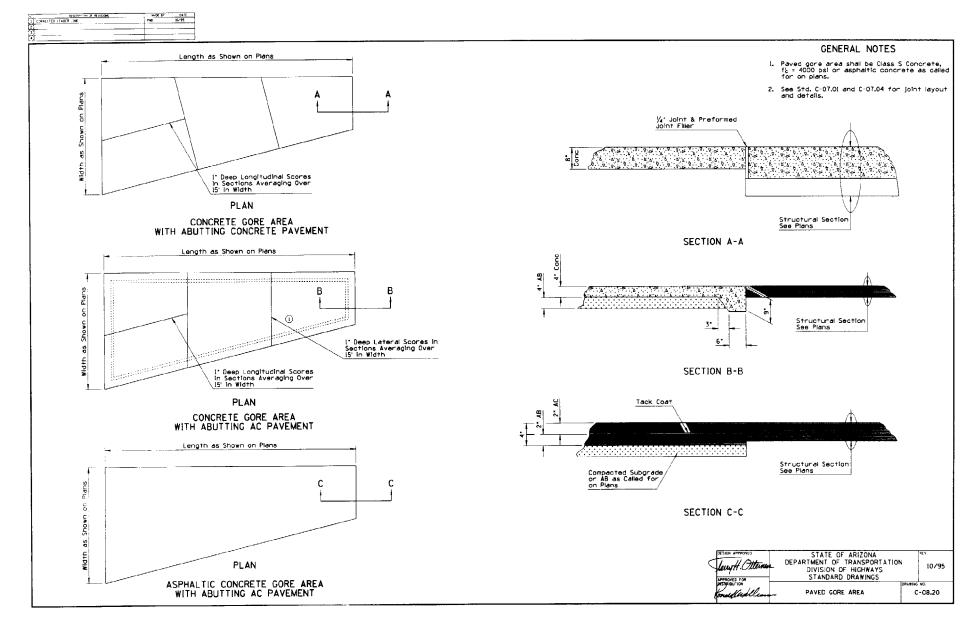
CROSSROAD AT RAMP TERMINAL

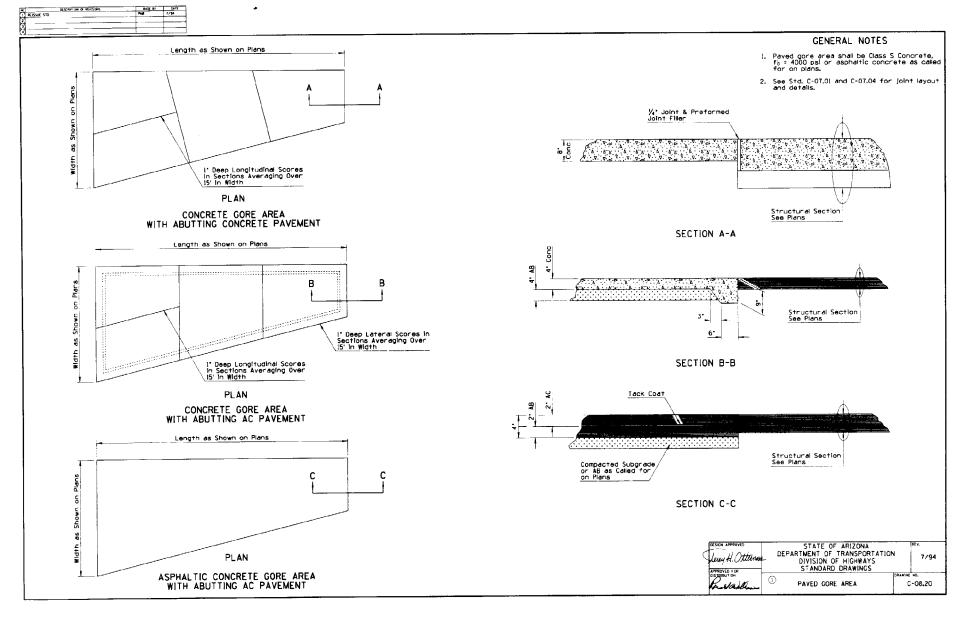
- 1. See Std C-07.01 for joint information.
- 2. See plans for crossroad dimensions.
- 3. See Std C-07.04 and C-07.05 for ramp joints.
- 4. The ratio of transverse to longitudinal joint spacing shall be greater than $\frac{2}{3}$ but not more than $\frac{1}{2}$.
- Transverse joints shall be perpendicular (90°) to the longitudinal joints, except as shown at the ramp terminal,
- ▲ 6' Mi∩imum
- Varies 18' Maximum
 8' Minimum
- Varies 12' when adjacent gutter widths are 2' or less.
 - 15' when adjacent gutter widths are greater than 2'.

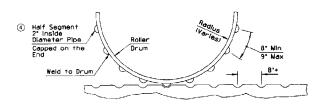




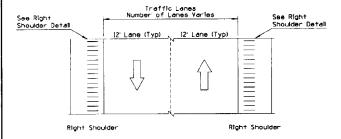




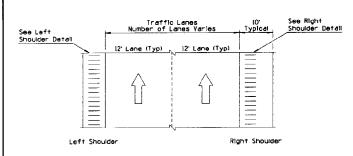




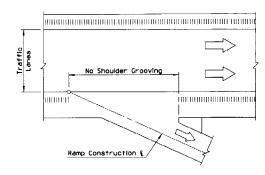
STEEL DRUM DETAIL



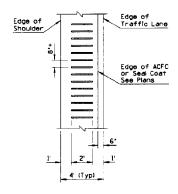
TYPICAL SHOULDER GROOVING PLAN
FOR UNDIVIDED HIGHWAYS



TYPICAL SHOULDER GROOVING PLAN FOR DIVIDED HIGHWAYS



RAMP EXCEPTION DETAIL
 ENTRANCE RAMP SIMILAR



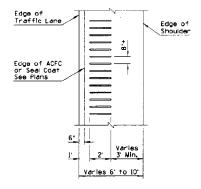
EFT SHOULDER GROOVING DETAIL
FOR DIVIDED HIGHWAYS
TYPICALLY 4' WIDE

GENERAL NOTES

- Shoulder Grooving shall be applied to the shoulders of rural highways when celled for on the Plans in accordance with the following shoulder widths: Undivided Highways - Shoulder 6' and greater Divided Highways - Right shoulders 6' and greater Left shoulders 4' and greater
 - Shoulder Grooving shall be omitted across principal intersecting roadways or other interruptions in normal shoulder width as directed by the Engineer.
- Shoulder Grooving shall be constructed by making indentations in the asphaltic concrete.

The indentations may be formed by rolling the hot asphalt concrete with a roller to which half segments of 2' inside diameter pipe have been welded to the drum. The pipe segments shall be 2' long and spaced at approximate 8' centers.

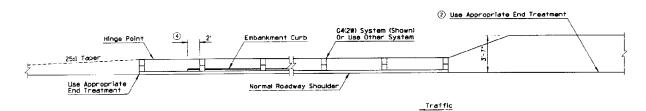
- Each roller shall be equipped with an acceptable guide that extends in front of the roller and is clearly visible to the operator in order that proper diignment of the completed scored shoulder is obtained.
- The contractor may utilize other equipment or methods to construct the shoulder grooving if approved by the Engineer.



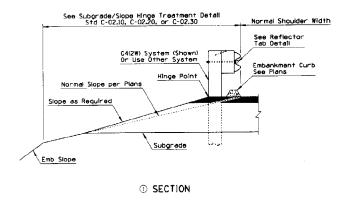
1 RIGHT SHOULDER GROOVING DETAIL SHOULDERS 6' AND WIDER

LINY H. OTTENNA	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		3/95
Constitution Constitution	GROOVING FOR BITUMINOUS SHOULDERS	DRAWING	-09 _• 10

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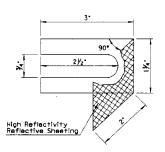


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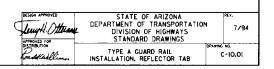


TYPE A GUARD RAIL INSTALLATION

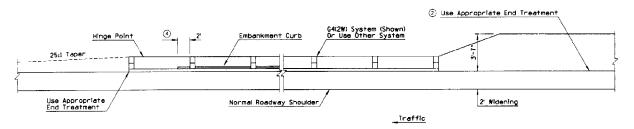
- All embankment curb shall be protected by guard rail.
- Cuard rail shall extend beyond the limits of embankment curb.
- 3 3. See Std. C-10.03 for measurement limits.
- 4. See Standard Specifications for spacing of reflector tabs.



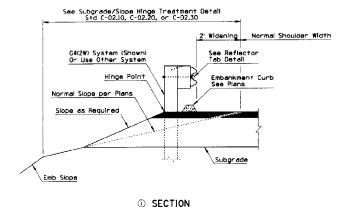
REFLECTOR TAB DETAIL



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2 REVISED NOTE	PNE	7/94
3 ADDED NOTE	Ple	7/94
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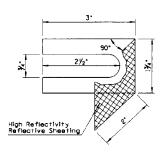


PLAN

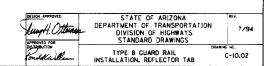


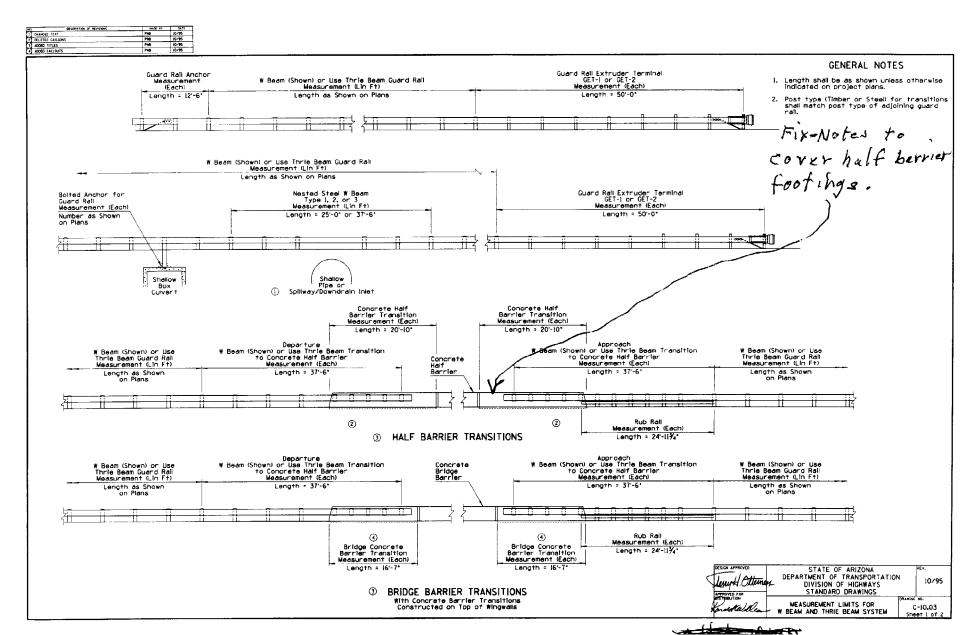
TYPE B GUARD RAIL INSTALLATION

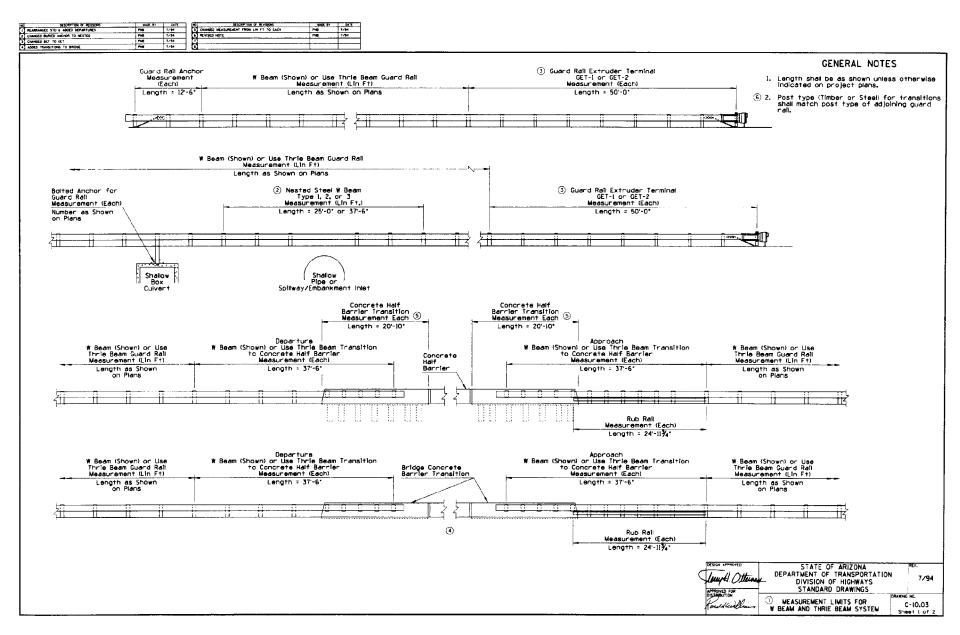
- All embankment curb shall be protected by guard rall.
- ② 2. Guard rail shall extend beyond the limits of embankment curb.
- (3) 3. See Std. C-10.03 for measurement limits.
- 3 4. See Standard Specifications for spacing of reflector tabs.



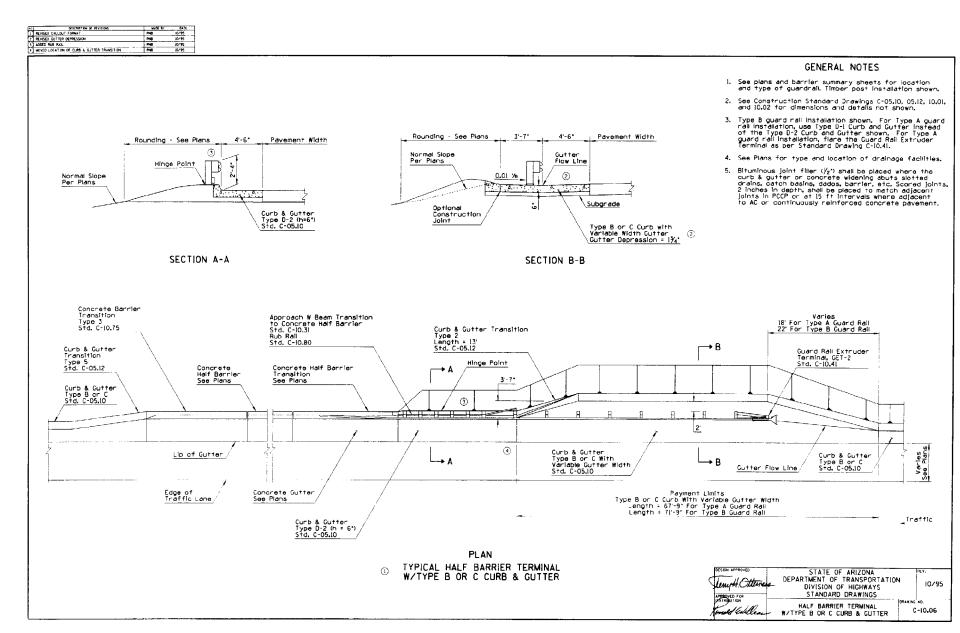
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ļ				Rub Rail Measurement (Each)	•	ļ
				Length = 24'-1174"	•	
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		Departure]
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-	Measurement (Lin Ft) Length as Shown on Plans	Length as Shown on Plans (37'-6" Typ)		Measurement (Each) ingth as Shown on Plans	Length as Shown on Plans	
		(37'-6" Typ)				
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- See plans and barrier summary sheets for location and type of quardrall, Timber post installation shown.
- See Construction Standard Drawings C-05.10, 05.12, 10.01, and 10.02 for dimensions and details not shown.
- Type 8 guard rall installation shown. For Type A guard installation, use Type D-1 Curb and Gutter instead of the Type D-2 Curb and Gutter shown.
- 4. See Plans for type and location of drainage facilities.
- 5. Bituminous joint filler (1/2") shall be placed where the curb & gutter or concrete widening abuts stotted drains, catch basins, dados, barrier, etc. Two inch (2") deep scored joints shall be placed to match adjacent joints in PCCP or at 15 fft intervals where adjacent to AC or continuously reinforced concrete pavement.

STATE OF ARIZONA

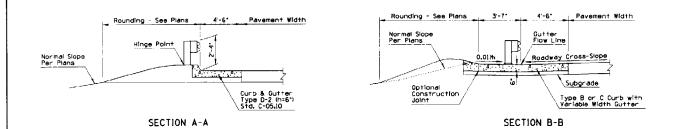
DEPARTMENT OF TRANSPORTATION

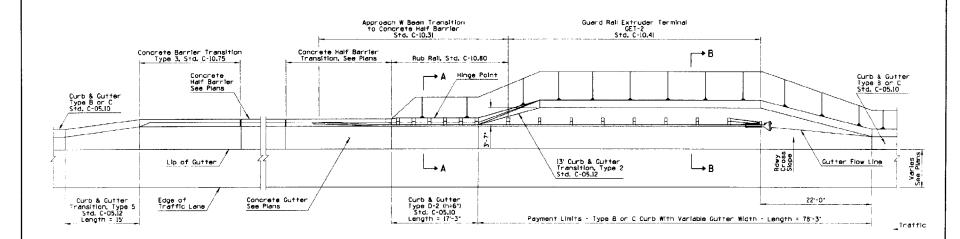
W/TYPE B OR C CURB & GUTTER

DIVISION OF HIGHWAYS STANDARD DRAWINGS HALF BARRIER TERMINAL 7/94

C-10.06

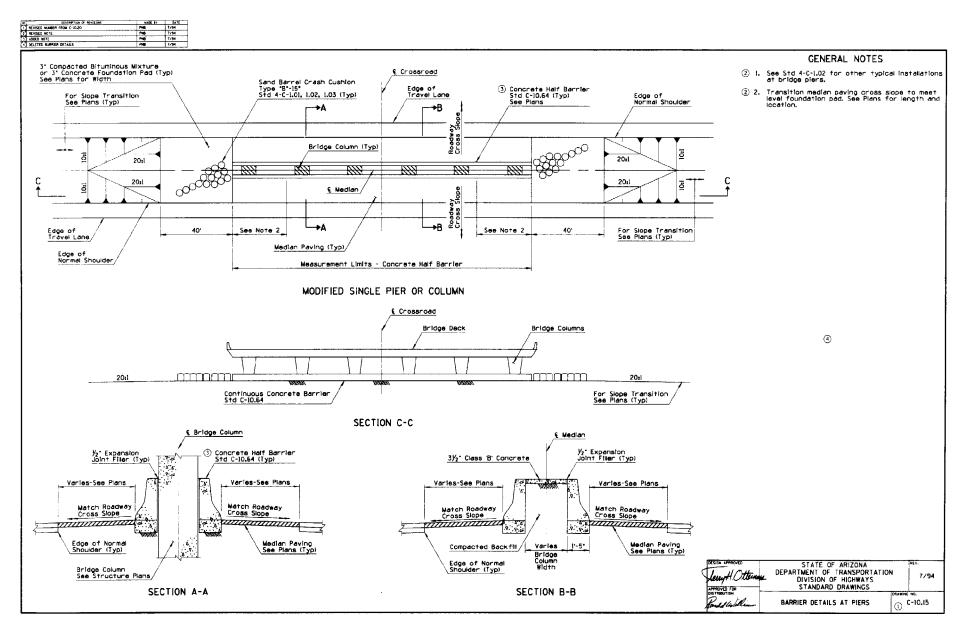
Lewy H. Otternas

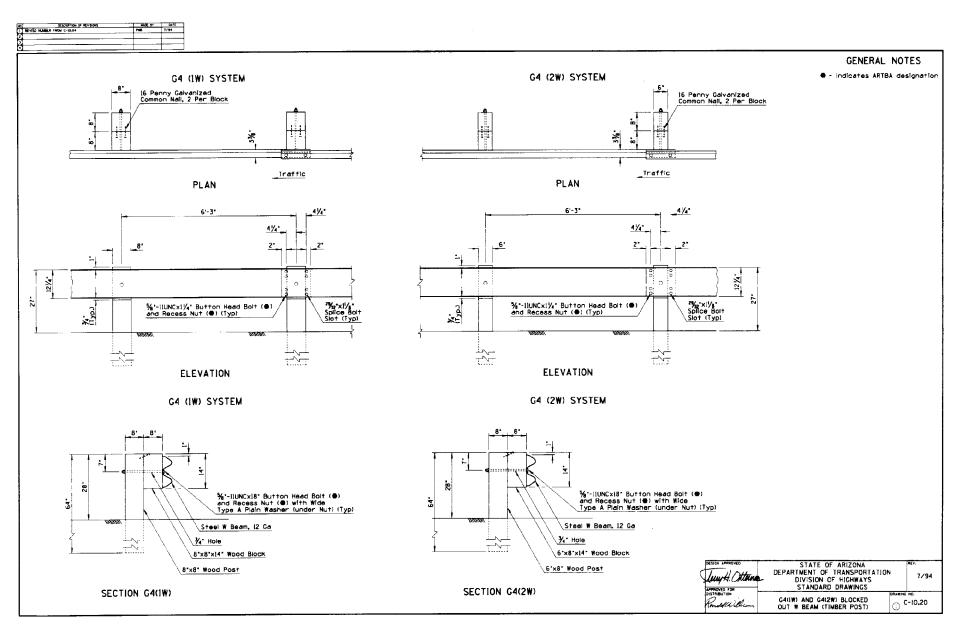


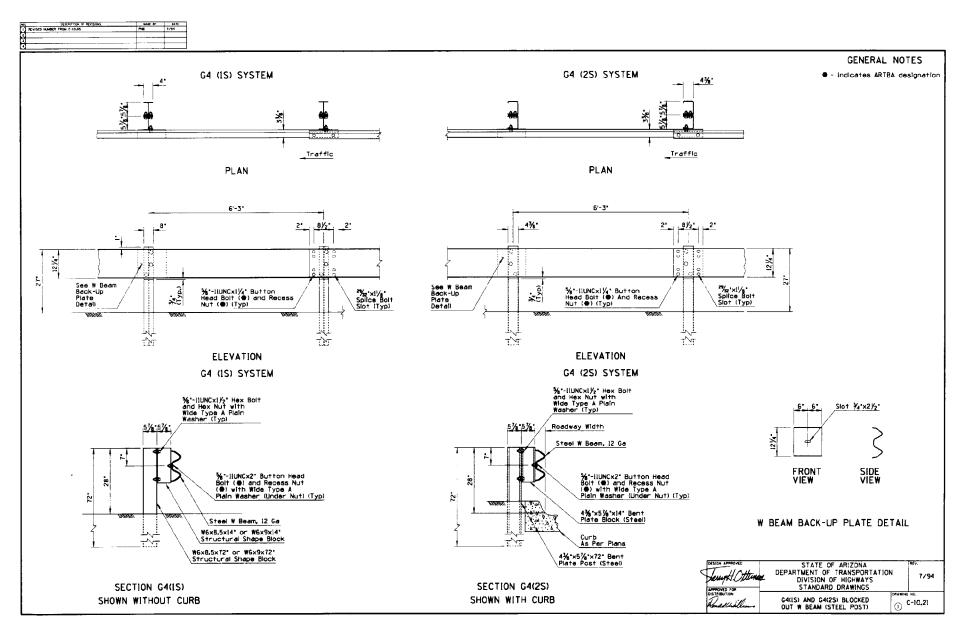


PLAN
TYPICAL HALF BARRIER TERMINAL

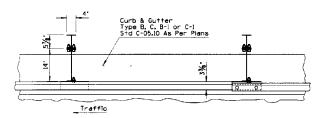
W/TYPE B OR C CURB & GUTTER



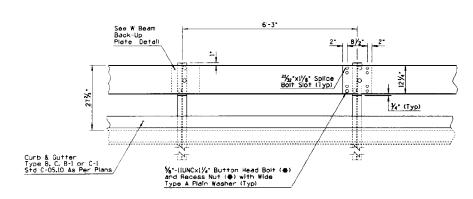




- Height of curb shall not exceed 4 inches.
- indicates ARTBA designation

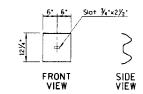


PLAN

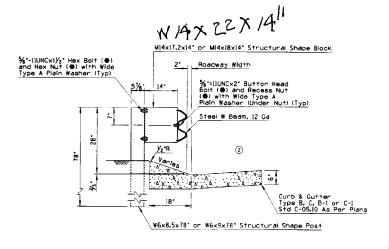


ELEVATION

G4(1S-MODIFIED)

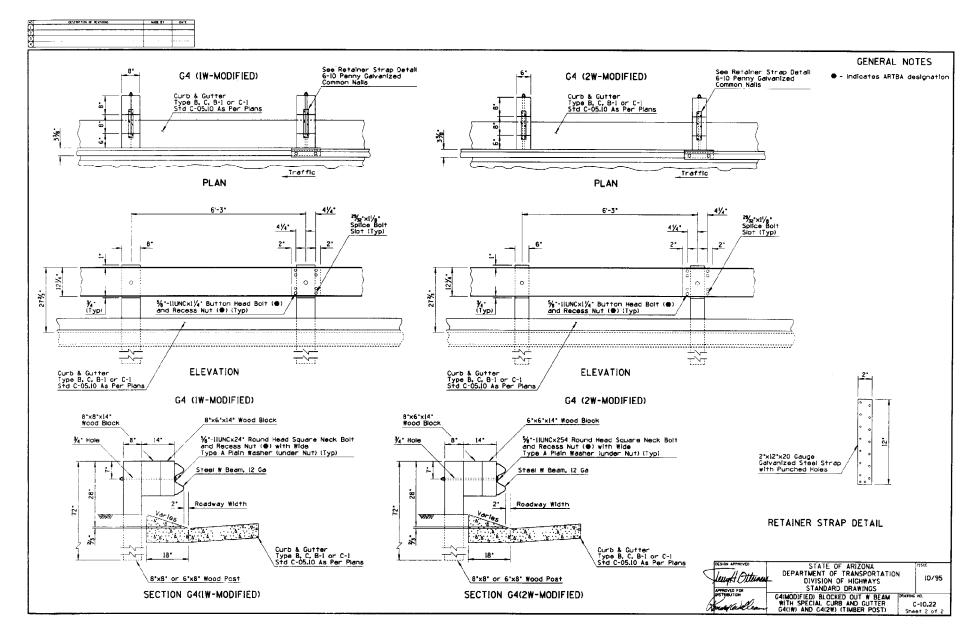


W BEAM BACK-UP PLATE DETAIL



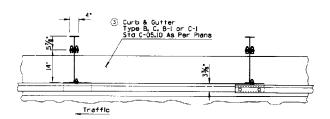
SECTION

DESIGN APPROVED	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION	REV.
HELLYH Otterne	DIVISION OF HIGHWAYS STANDARD DRAWINGS	10/95
muldle sellen	G4(MODIFIED) BLOCKED OUT W BEAM WITH SPECIAL CURB AND GUITER G4(IS-MODIFIED) (STEEL POST)	NO. -10.22 ref ! of ?

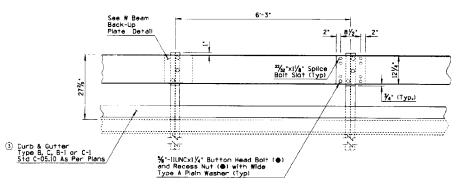


MO	DESCRIPTION OF REVISIONS	WADE 6Y	DATE
10	REVISED NUMBER FROM C-10.06	PNB	T/94
2	ADDED MOTE	PNB	7/94
13	REVISED MOTE	PMB	7/94
14	DELETED DIMENSION	748	7/94

- ② 1. Height of curb shall not exceed 4 inches.
 - Indicates ARTBA designation

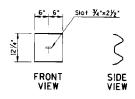


PLAN

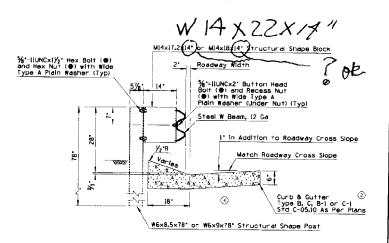


ELEVATION

G4(IS-MODIFIED)

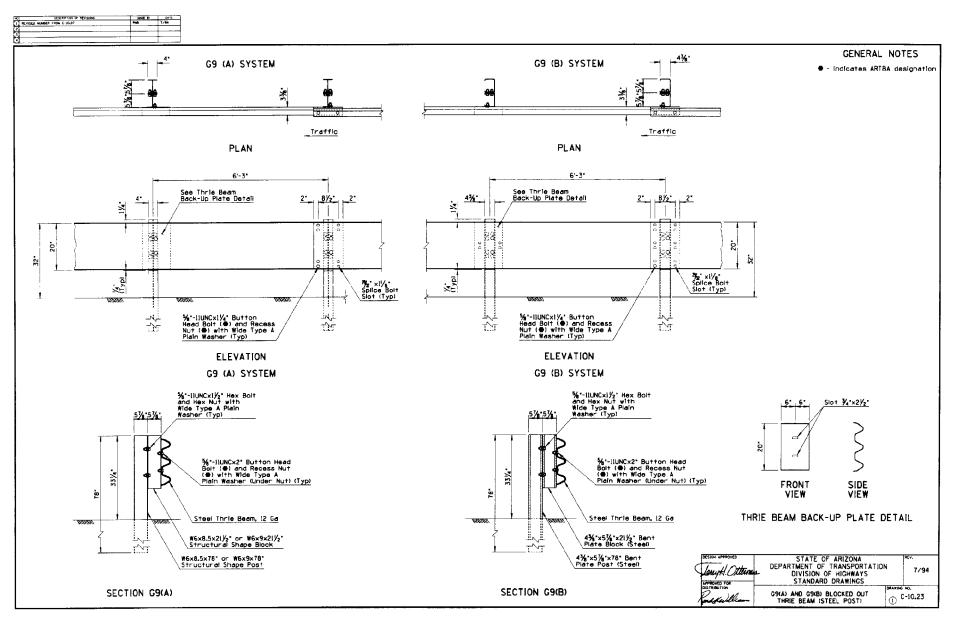


W BEAM BACK-UP PLATE DETAIL



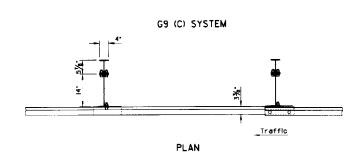
SECTION



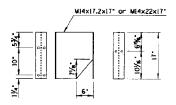


MO	DESCRIPTION OF REVISIONS	MADE 87	DATE
1 REVISE	D MUNBER FROM C-10.08	PNB	7/94
27			
31			
_			

- Indicates ARTBA designation

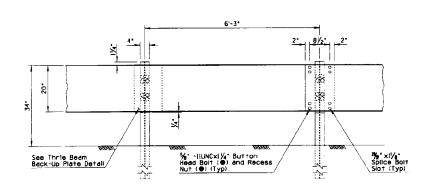


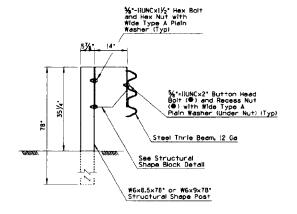
R SIDE VIEW



THRIE BEAM BACK-UP PLATE DETAIL

STRUCTURAL SHAPE BLOCK DETAIL

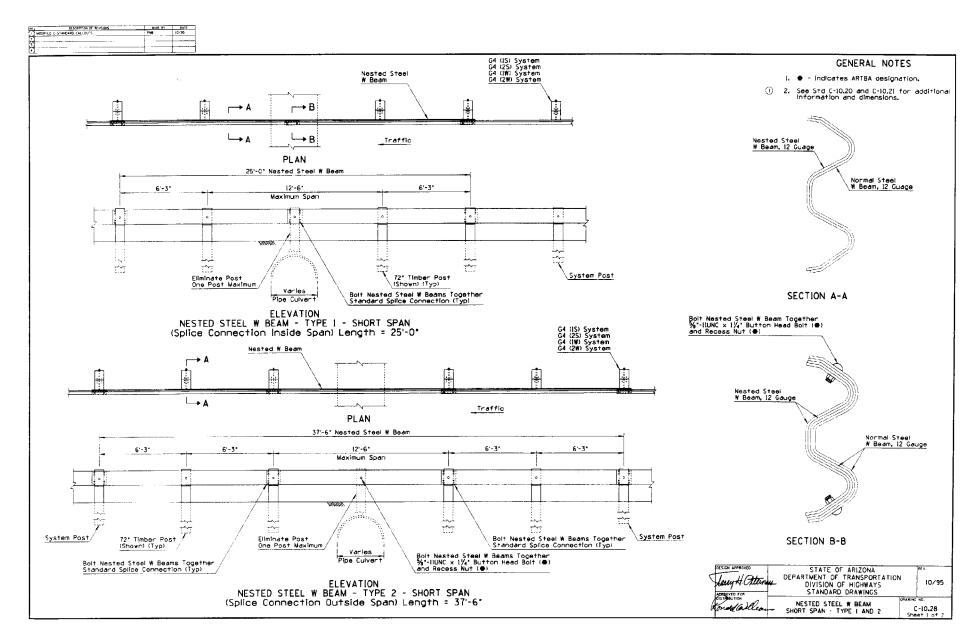


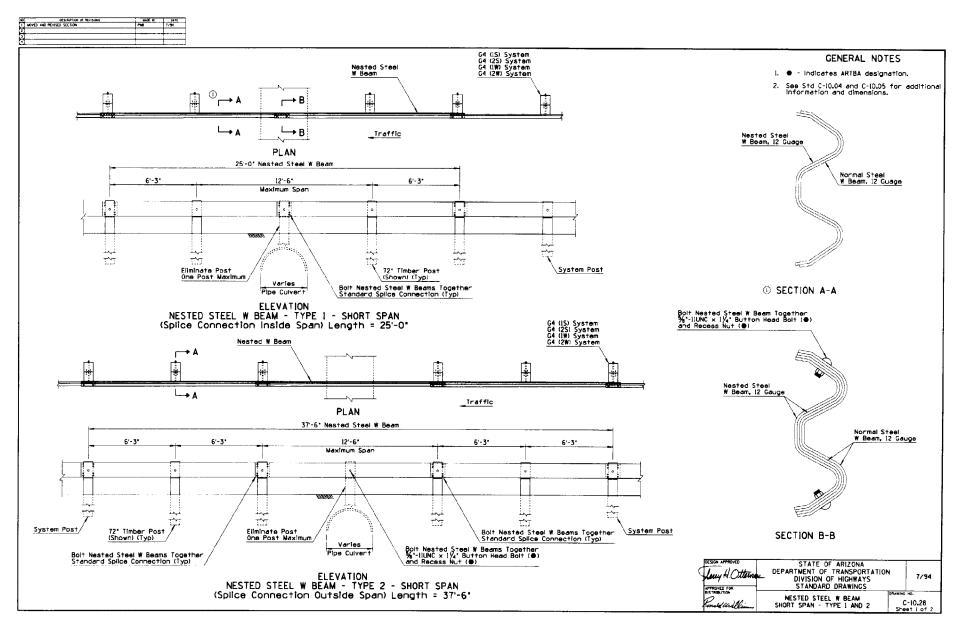


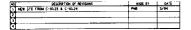
ELEVATION
G9 (C) SYSTEM

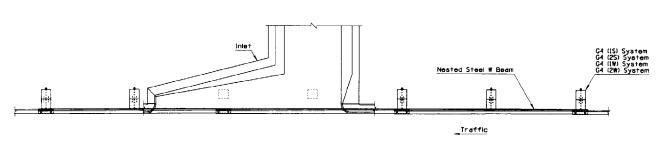
SECTION G9(C)

DESIGN APPROVED LEWH OTHER	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATIO DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. N 7/94
ROSSAGE CONTRACTOR	G9(C) BLOCKED OUT THRIE BEAM (STEEL POST)	C-IO.24

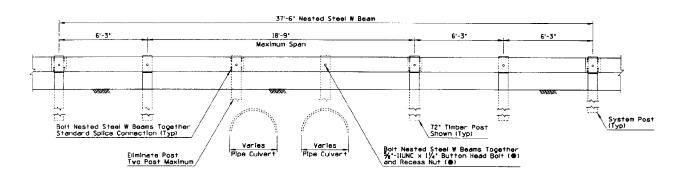








PLAN



ELEVATION

NESTED STEEL W BEAM - TYPE 3 - LONG SPAN Length = 37'-6"

LULY H. Ottemus	STATE OF ARIZONA DEPARTMENT OF TRANSPORTAT DIVISION OF HIGHWAYS STANDARD DRAWINGS	ION	3/94	
Mings These	NESTED STEEL W BEAM LONG SPAN - TYPE 3		6 NO. C-10.28	

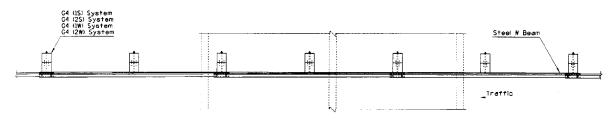
GENERAL NOTES

1. Use Type 3 Nested Steel W Beam to span downdrain or spliway injets as shown in the plan view.

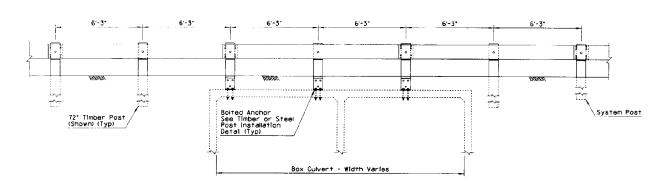
2. Use Type 3 to span multiple obstructions as shown in the elevation view.



GENERAL NOTES



PLAN



ELEVATION

BOLTED ANCHOR
BOX CULVERT INSTALLATION

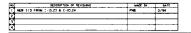
DESIGN APPROVES

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

STANDARD DRAWINGS

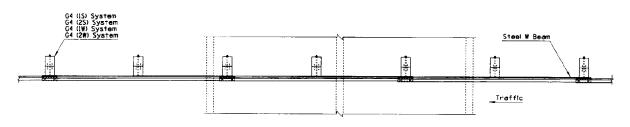
BOLTED ANCHOR
GUARD RAIL

OF ARMS NO. 10/95

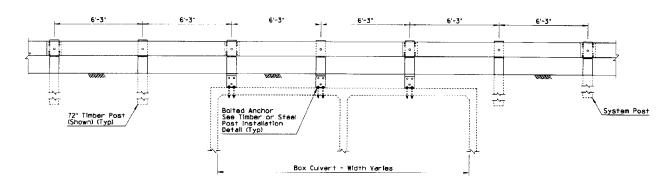


GENERAL NOTES

l. See Std C-10.04 and C-10.05 for additional information and dimensions.



PLAN



ELEVATION

BOX CULVERT INSTALLATION

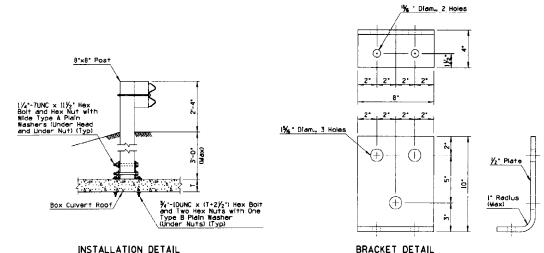
STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HICHWAYS
STANDARD DRAWINGS

BOLTED ANCHOR
GUARD RAIL

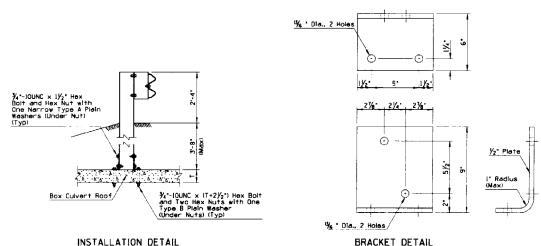
C-10.29 Sheet 1 of 2

3/94





BOLTED ANCHOR TIMBER POST INSTALLATION DETAIL



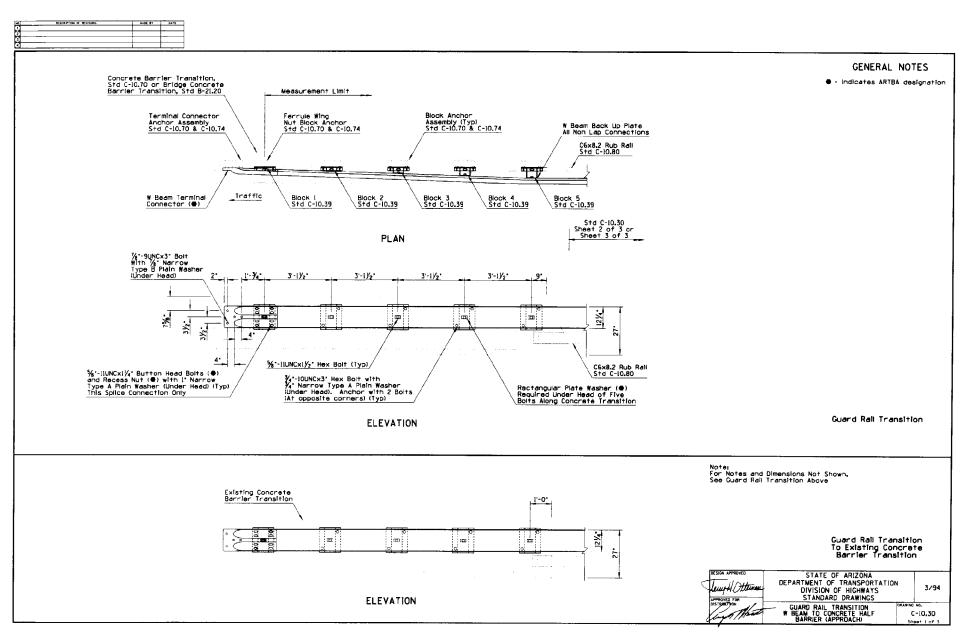
BOLTED ANCHOR
STEEL POST INSTALLATION DETAIL

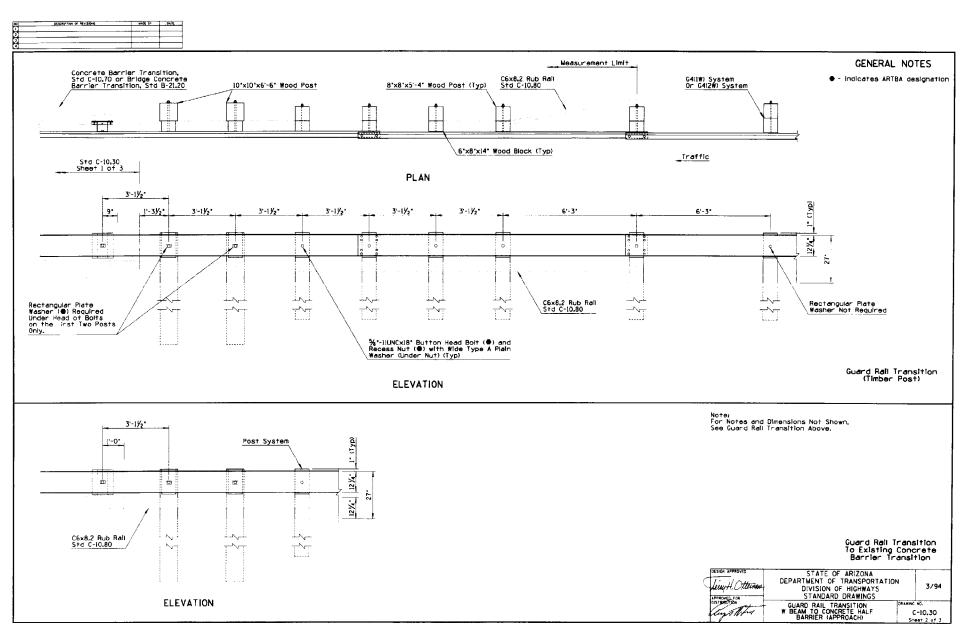
GENERAL NOTES 1. Drill through top of box culvert with rotary drill.

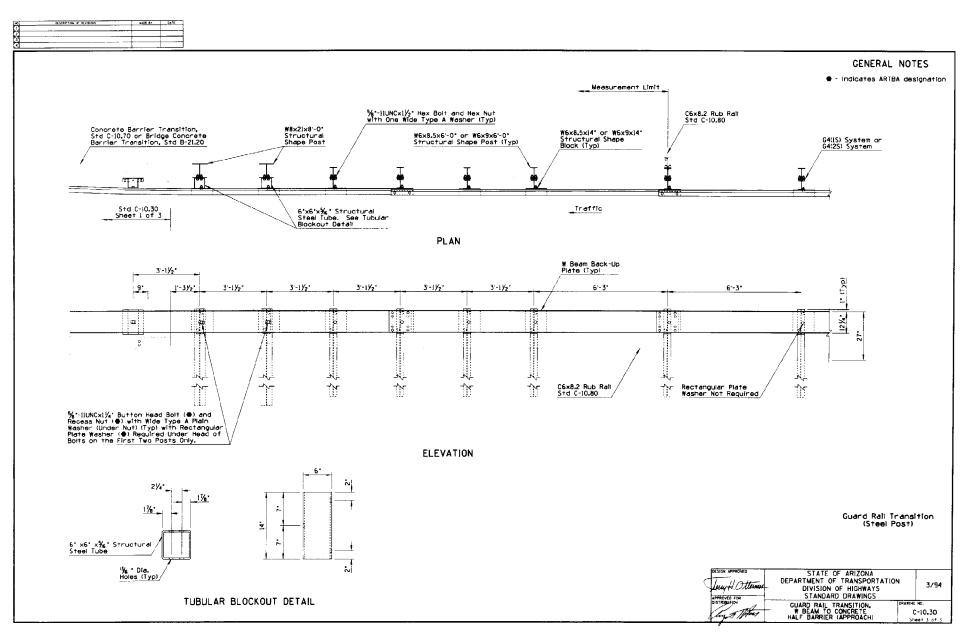
- Bracket may be made of one piece hot bent, or two pieces welded together.
- Short timber posts enchored to box culvert roof shall be 8" x 8" only.

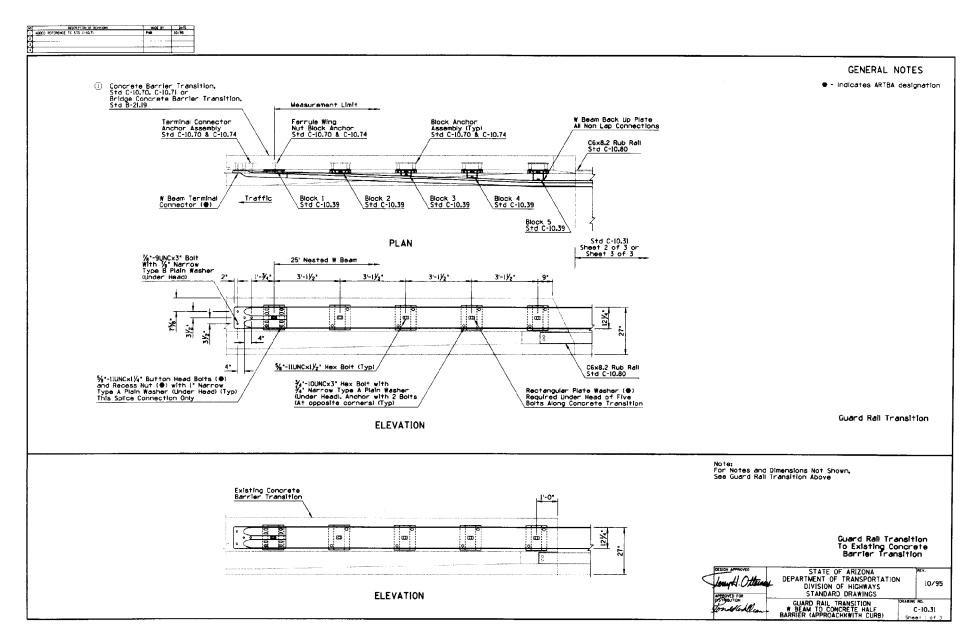
STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION 3/94 DIVISION OF HIGHWAYS STANDARD DRAWINGS BOLTED ANCHOR C-10.29

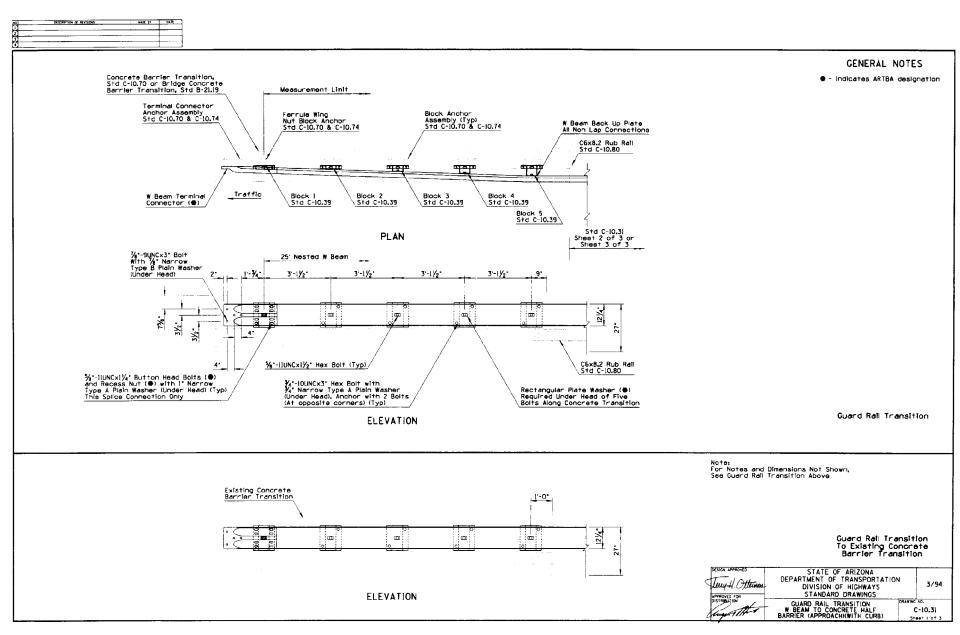
Sheet 2 of 2

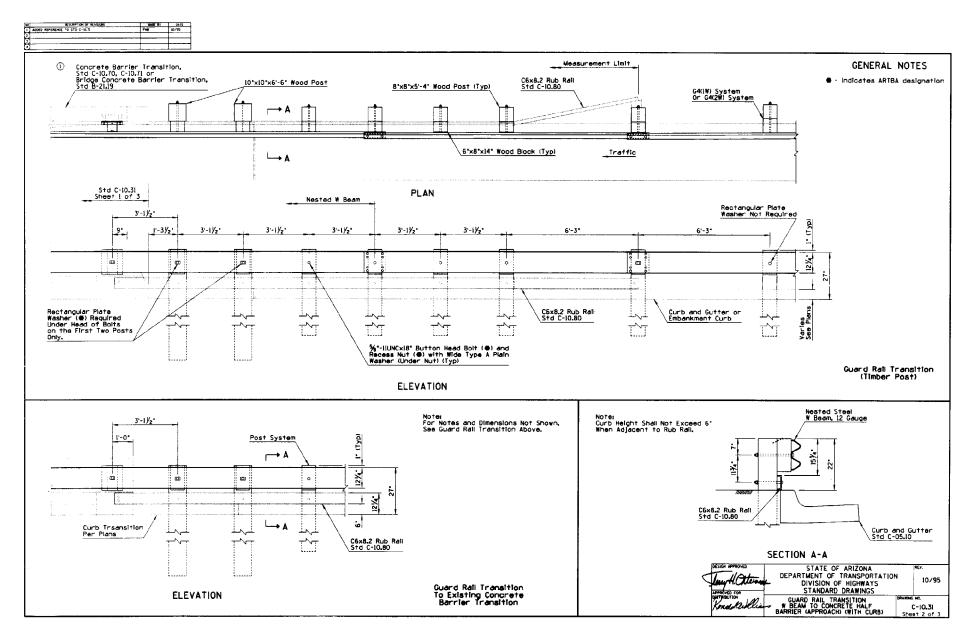


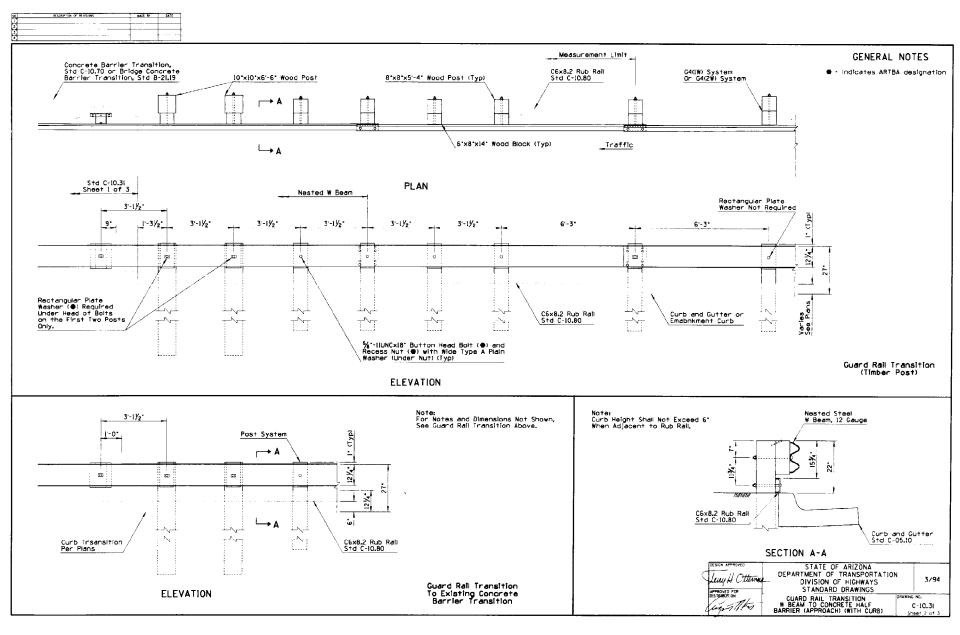


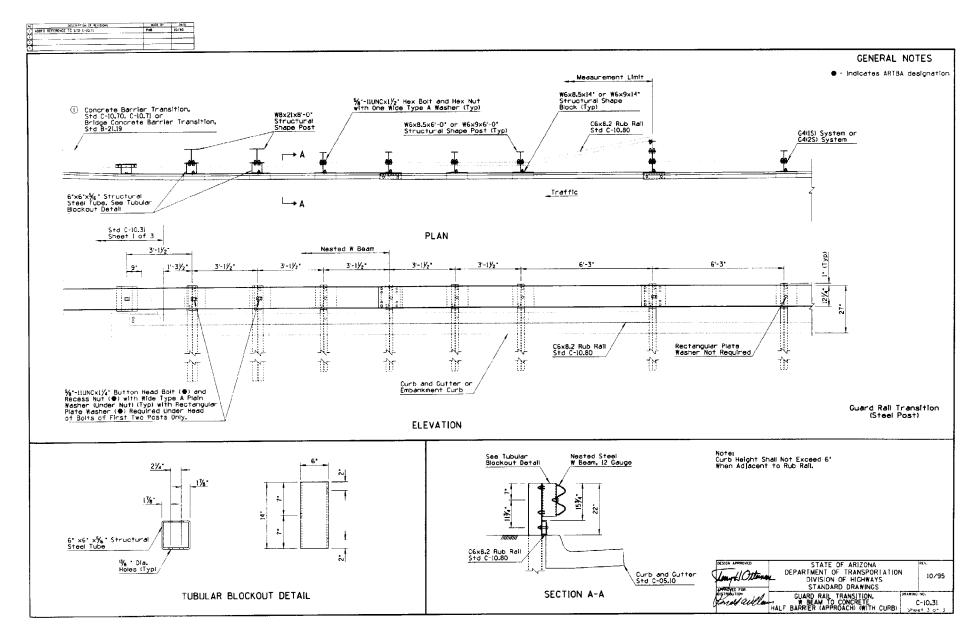


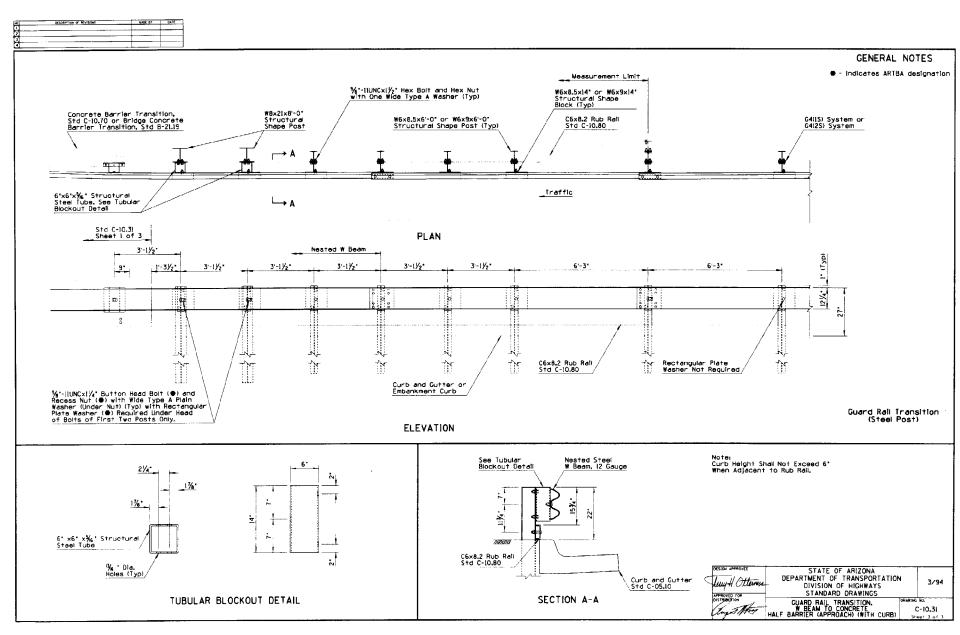


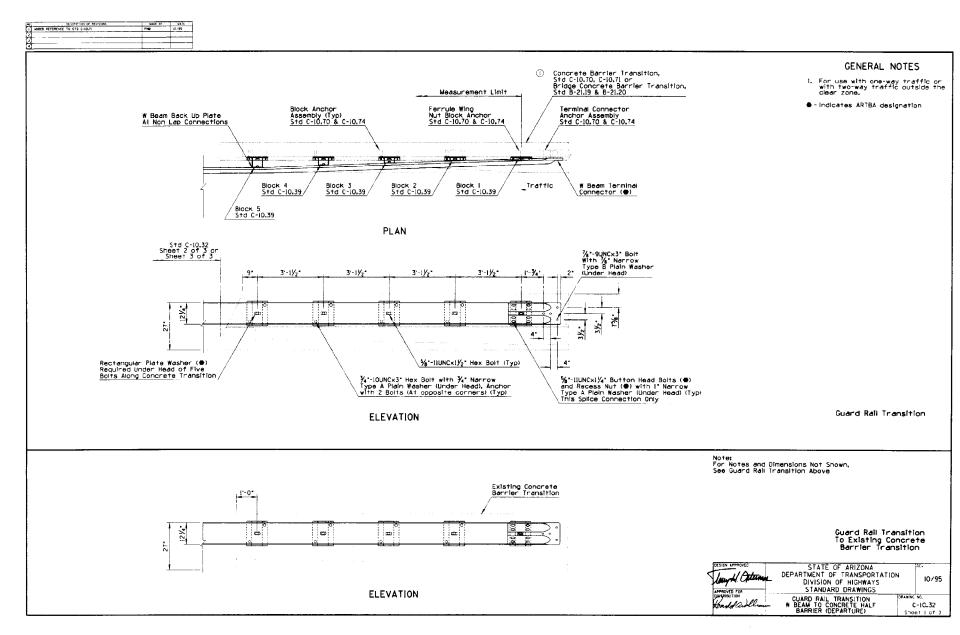


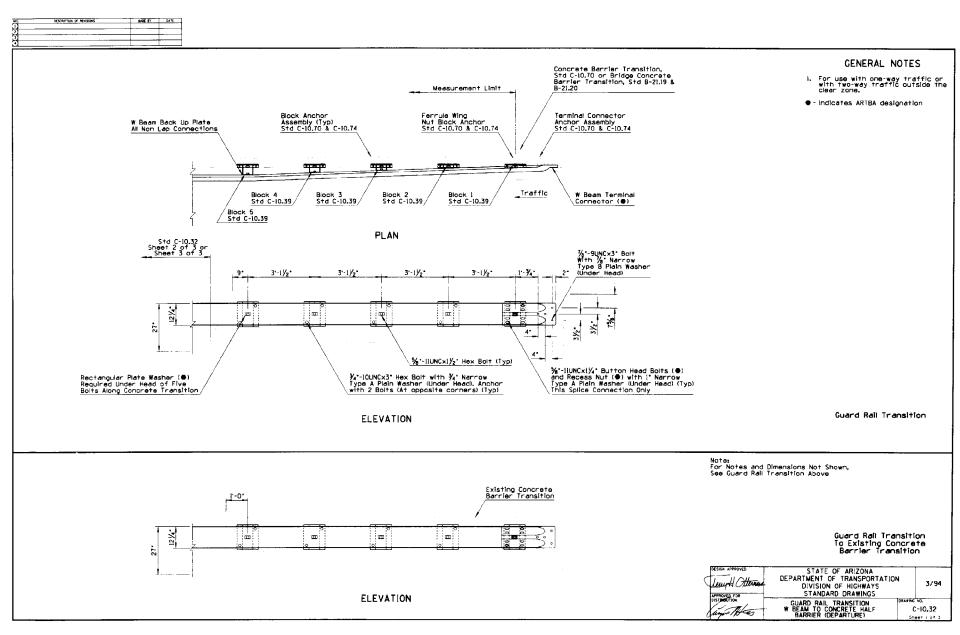


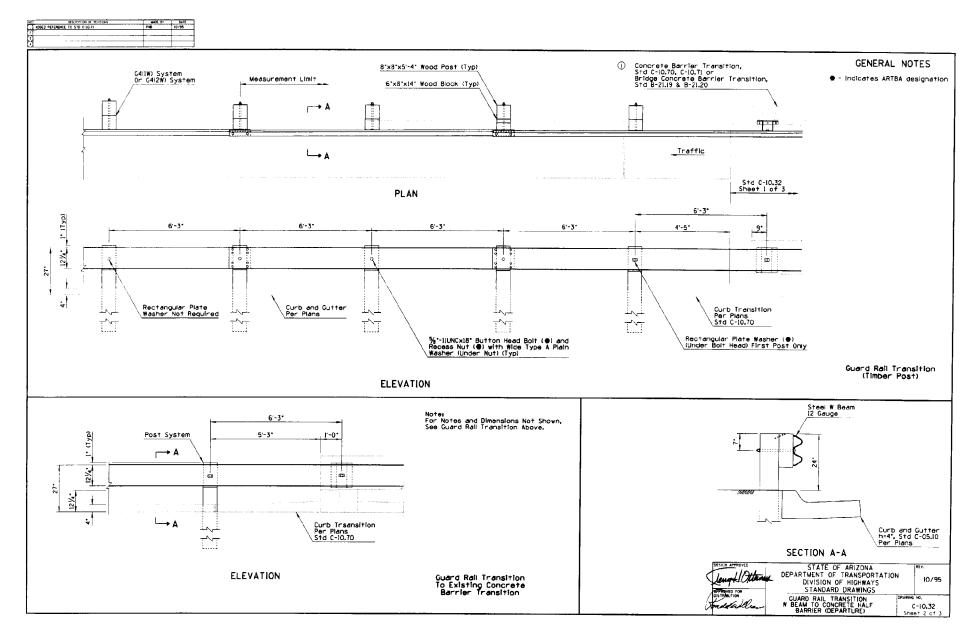


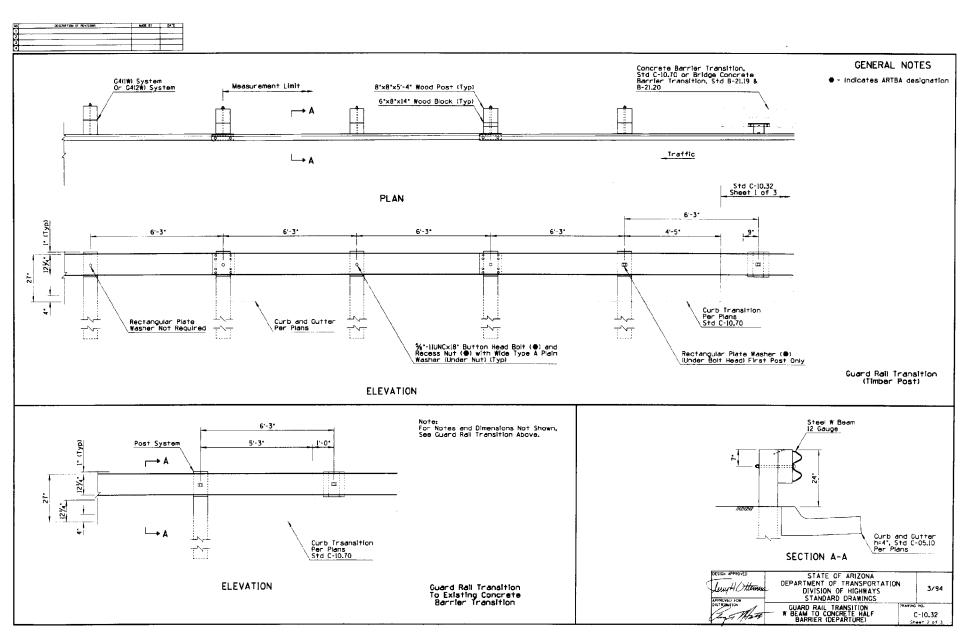


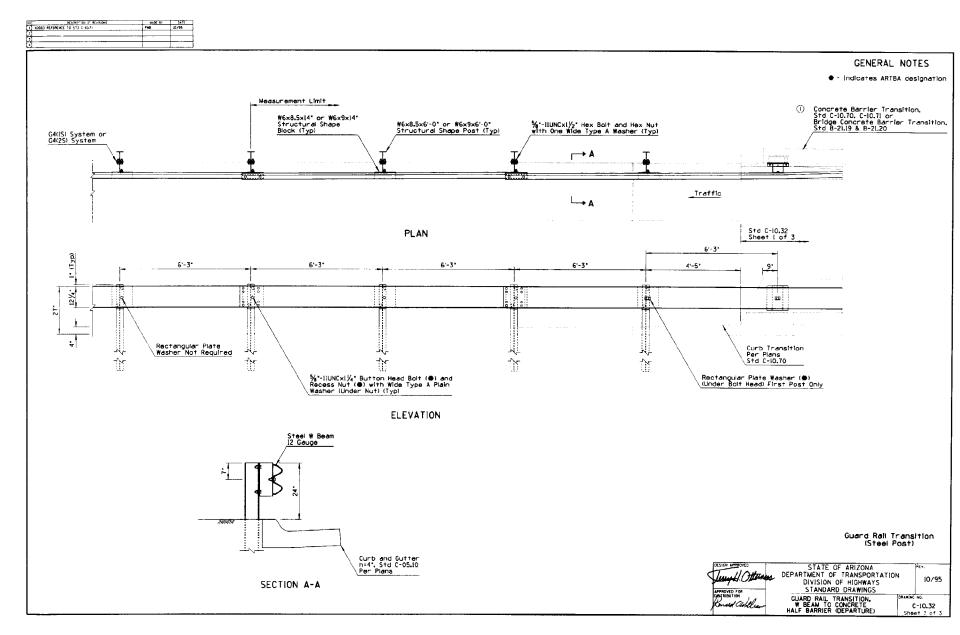


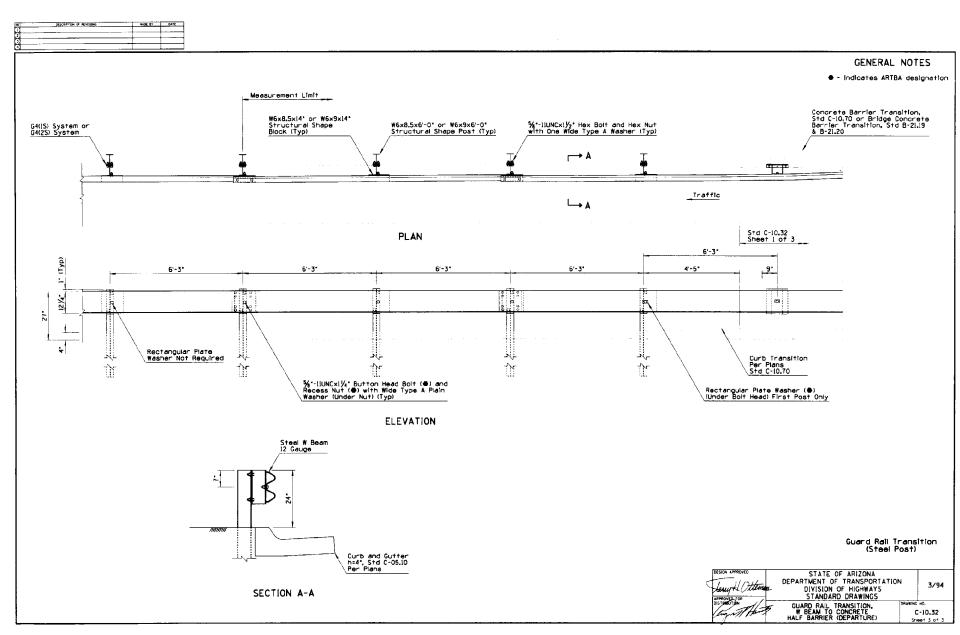




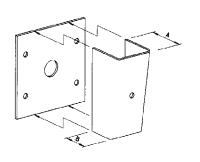






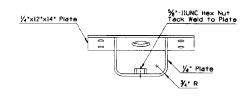


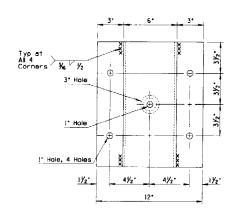


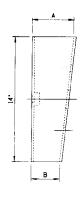


	DIMENSION		
BLOCK	A	В	
2	11/4"	%.	
3	21/2-	134.	
4	3"/6"	25%	
5	45%	3%6.	

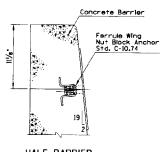
Note: Block i is a 1/4"x12"x14" Plate



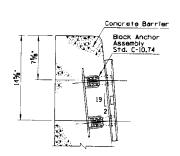




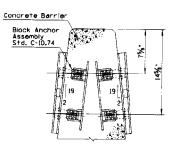
Blocks 2,3,4 and 5



HALF BARRIER (BLOCK 1 SHOWN)



HALF BARRIER (BLOCK 2 SHOWN)

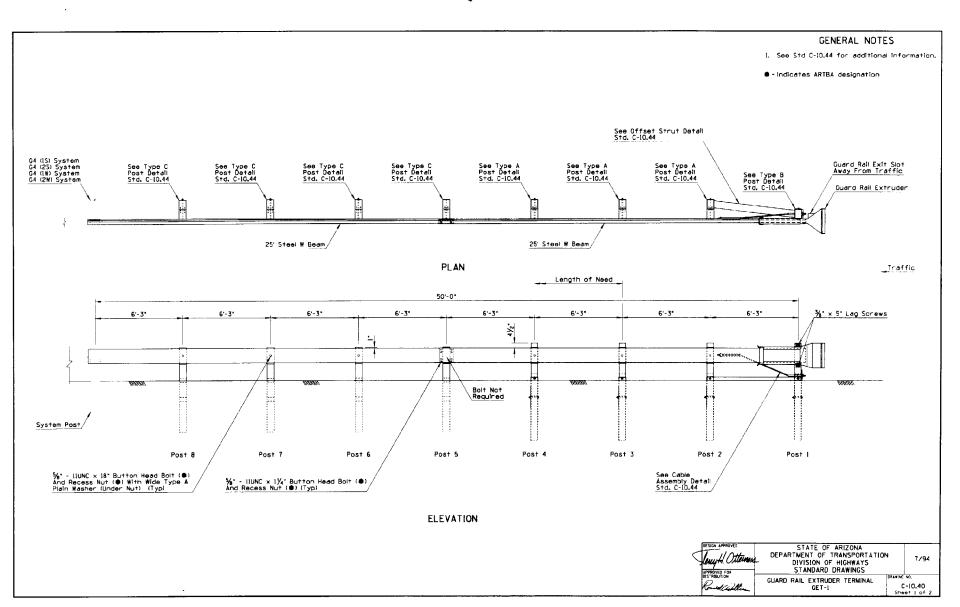


MEDIAN BARRIER (BLOCK 2 SHOWN)

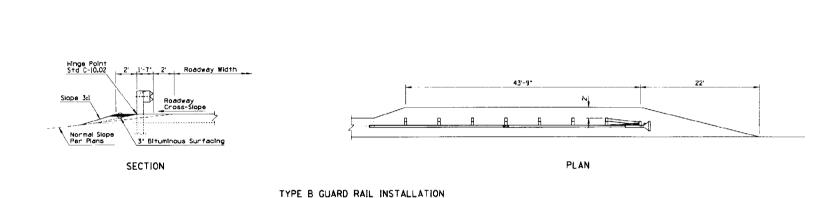
BLOCK AND ANCHORAGE DETAILS

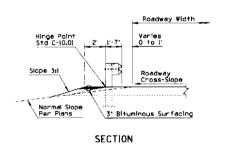
DESIGN APPROVED LEWY H. Ottomess APPROVED FOR	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		3/94
duyes / Hars	HARDWARE FOR W BEAM TRANSITION TO CONCRETE BARRIER	DRAWING	-10.39

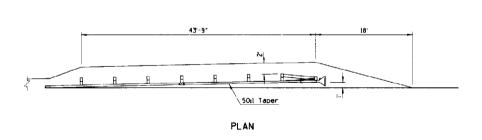
BLOCK DETAILS



Delete

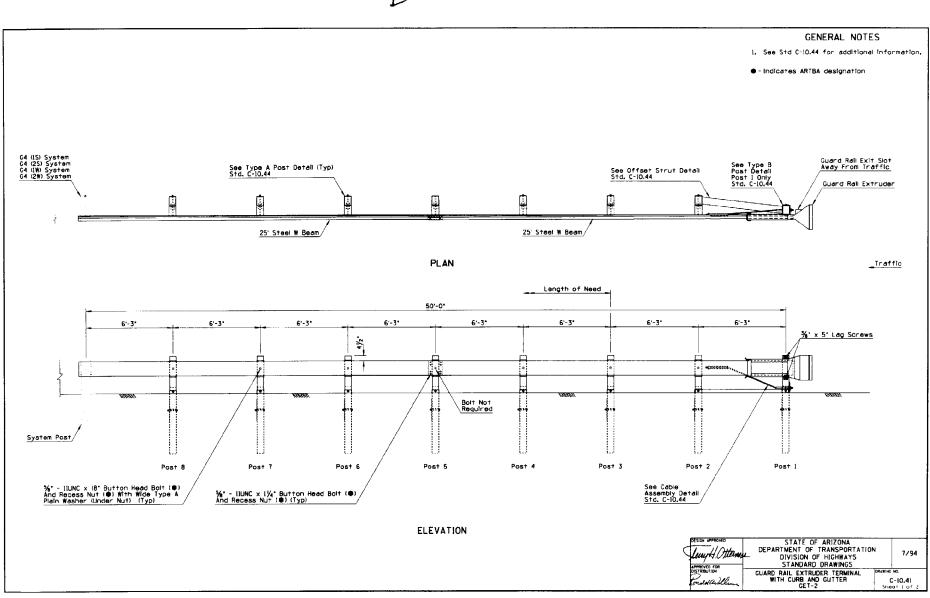




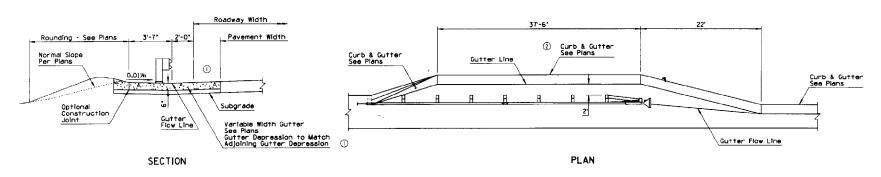


TYPE A GUARD RAIL INSTALLATION

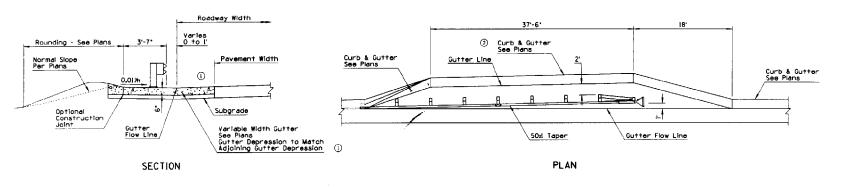
Jerry H. Ottomen	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATIO DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/94
Enold/William	GUARD RAIL EXTRUDER TERMINAL CET-I	no. -10.40 et 2 of 2





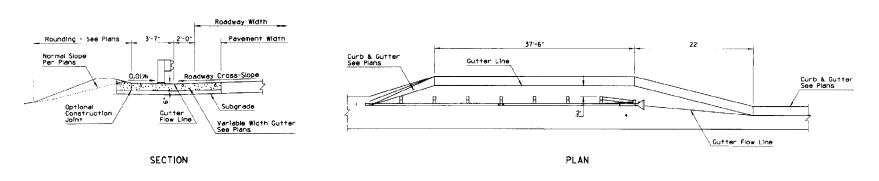


TYPE B GUARD RAIL INSTALLATION

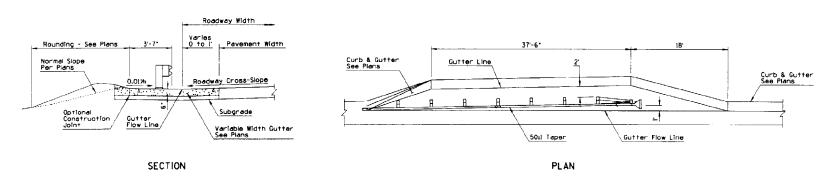


TYPE A GUARD RAIL INSTALLATION

Knaprikliam	WITH CURB AND GUTTER GET-2		C-10.41
DISTRIBUTION	GUARD RAIL EXTRUDER TERMINAL	ORATING	NÓ.
ARROYED FOR	STANDARD DRAWINGS		
MILLIAN CHEMAL	DIVISION OF HIGHWAYS		10/95
Thurt Otterran	DEPARTMENT OF TRANSPORTATION	N	10.00
DESIGN APPROVED	STATE OF ARIZONA		REV.



TYPE B GUARD RAIL INSTALLATION



TYPE A GUARD RAIL INSTALLATION

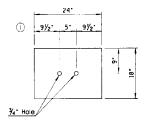


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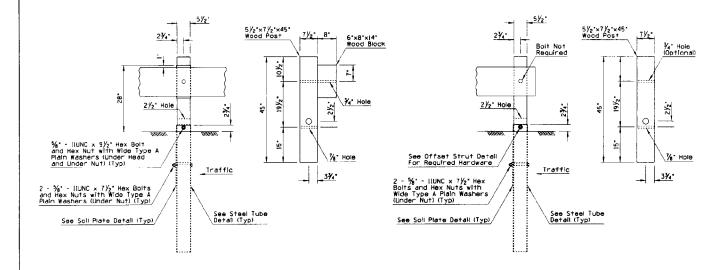


 Soll plates, steel tubes, offset strut, yokes, bearing plate and pipe sleeve shall be fabricated from structural steel ASTM A36.

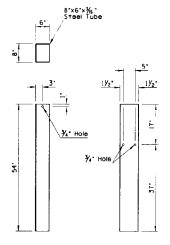


18"×24"×1/4"
SOIL PLATE DETAIL

TYPE A POST DETAIL



TYPE B POST DETAIL



STEEL TUBE DETAIL

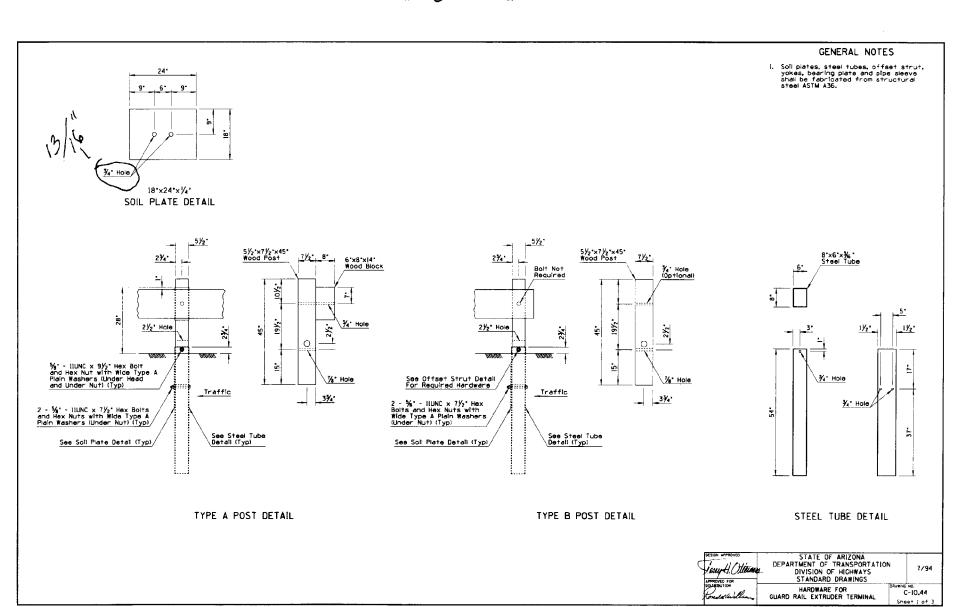
STATE OF ARIZONA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HICHWAYS
STANDARD DRAWINGS

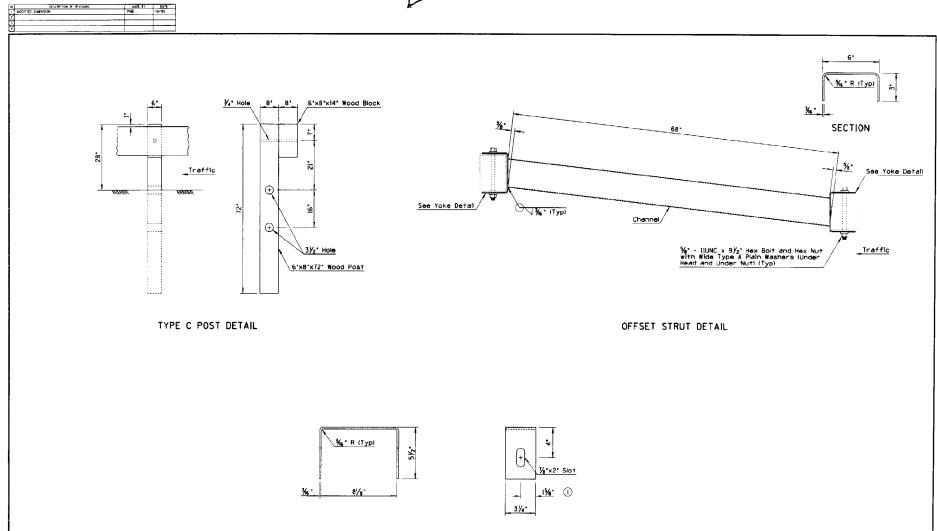
STANDARD DRAWINGS

HARDWARE FOR
CUARD RAIL EXTRUDER TERMINAL

Sheet 1 of 3



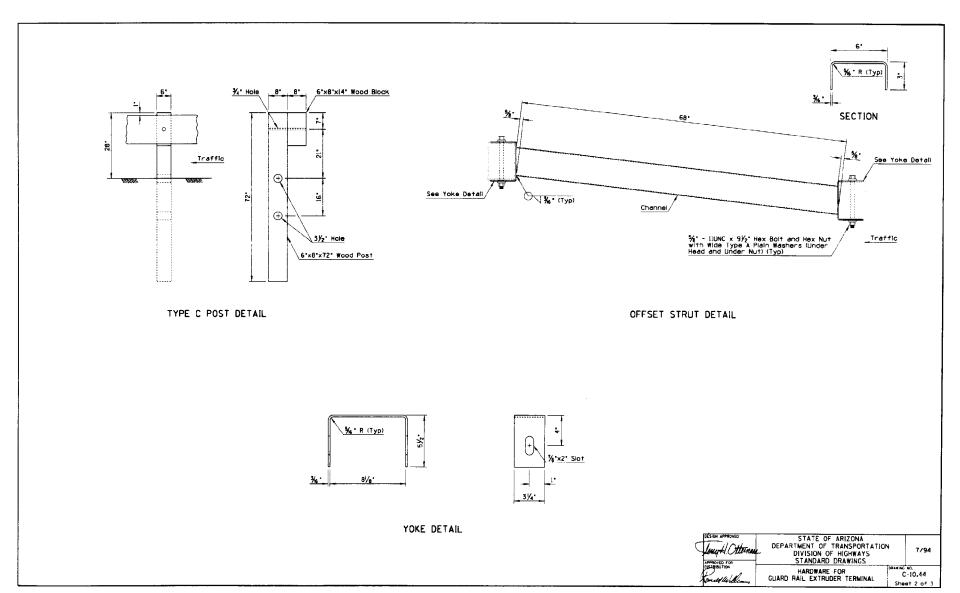
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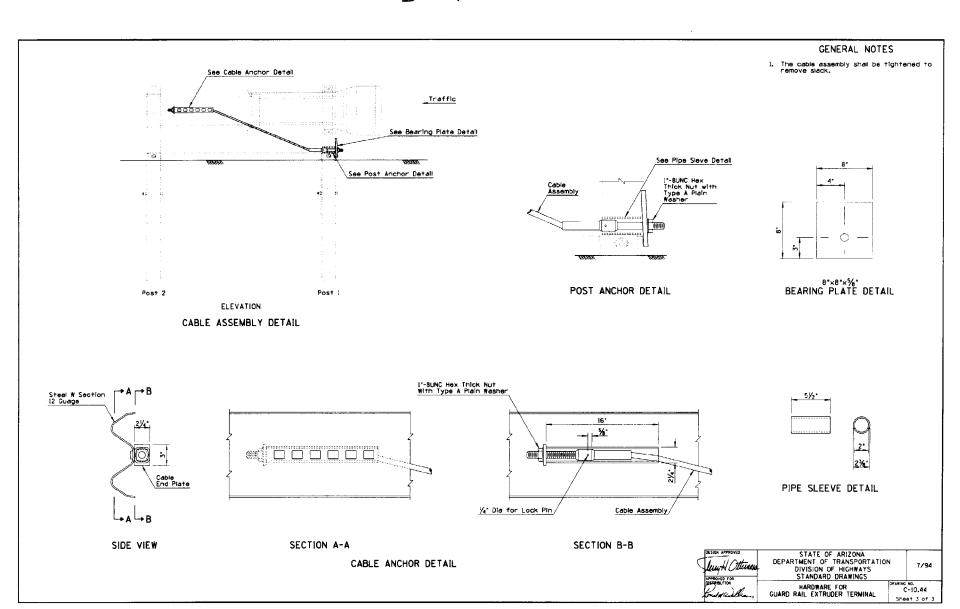


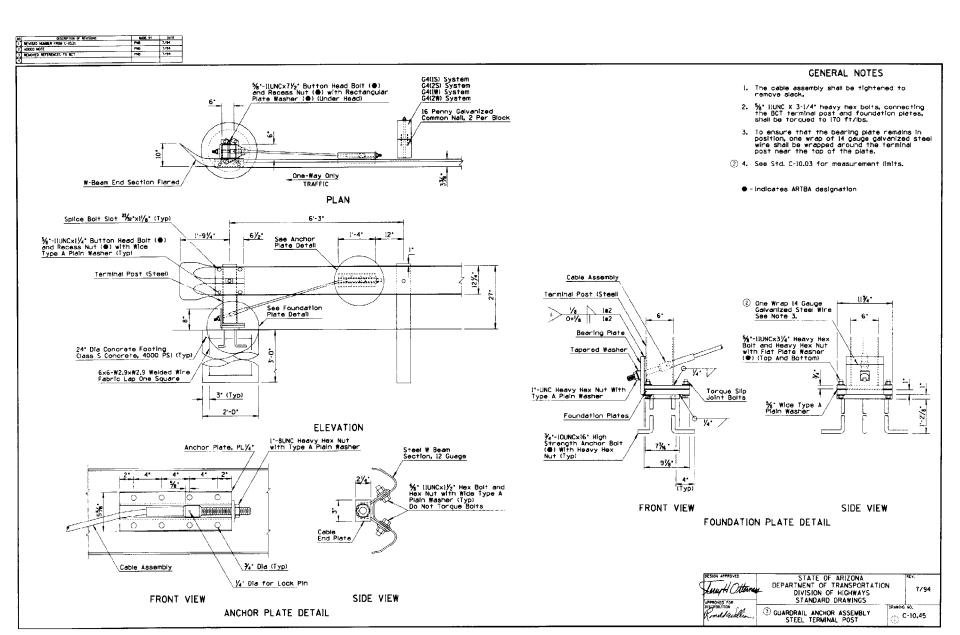
YOKE DETAIL

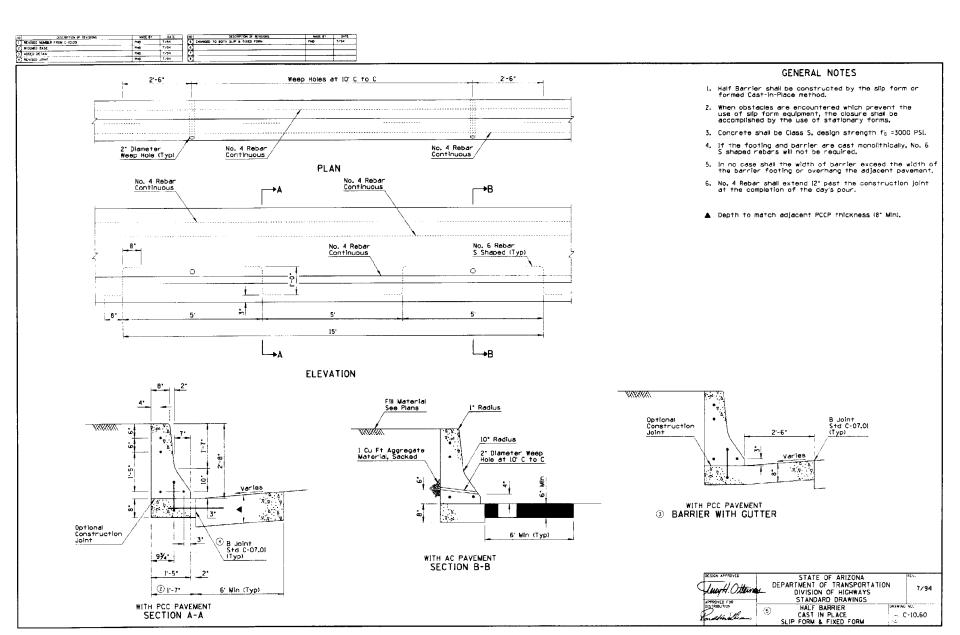
STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS 10/95 C-10.44 HARDWARE FOR GUARD RAIL EXTRUDER TERMINAL Sheet 2 of 3

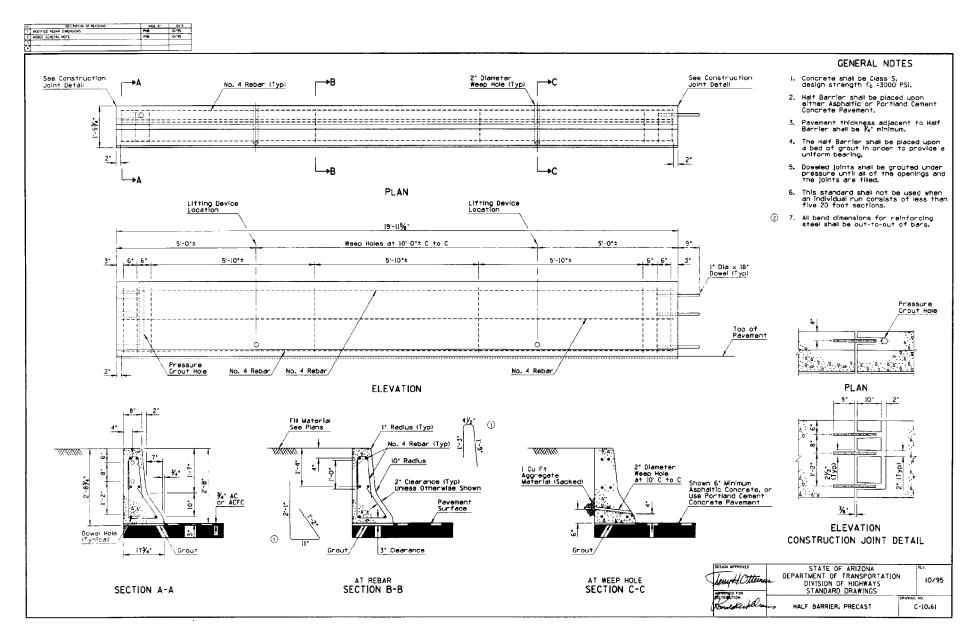
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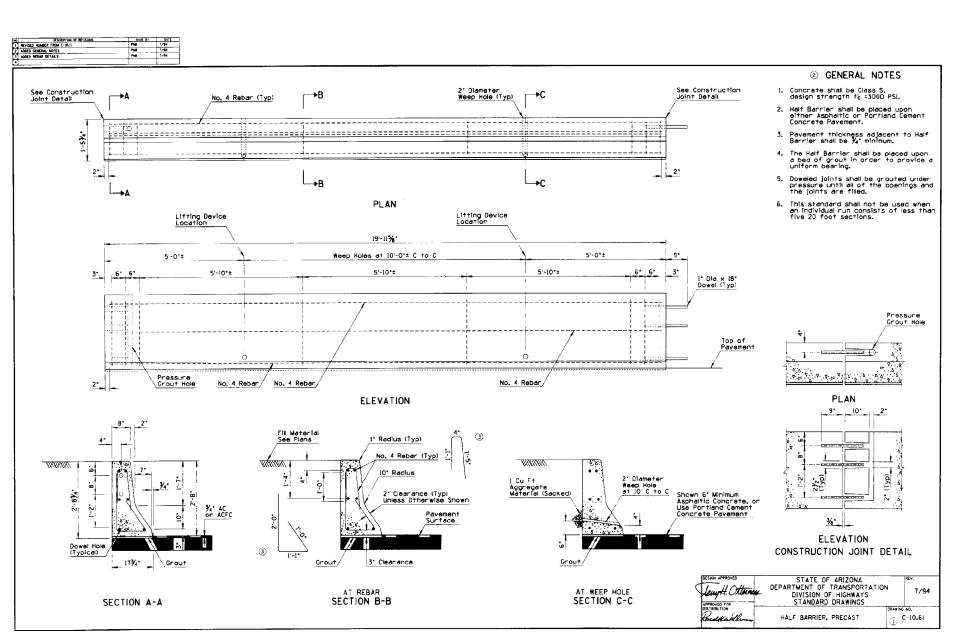


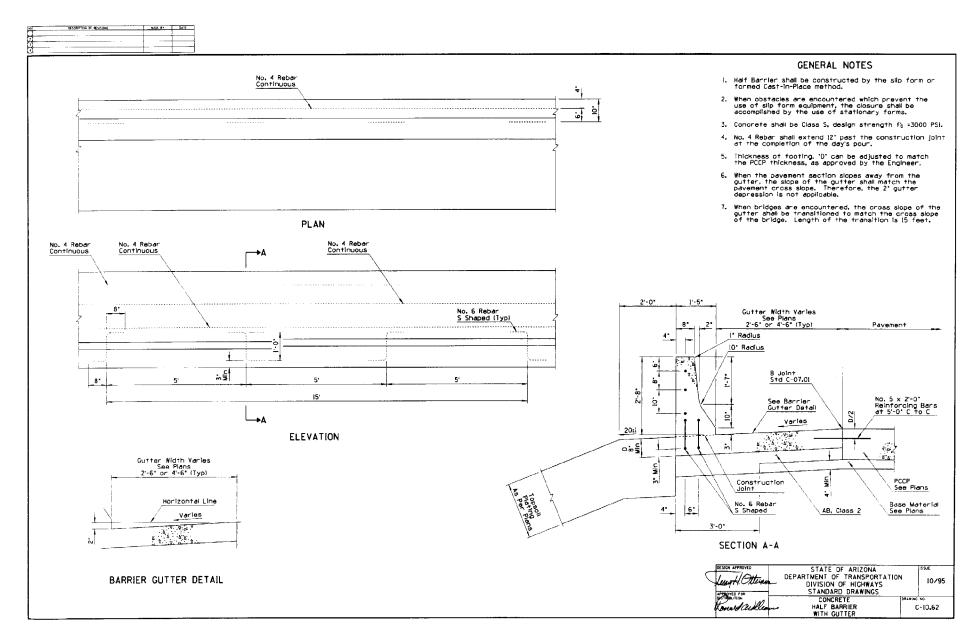


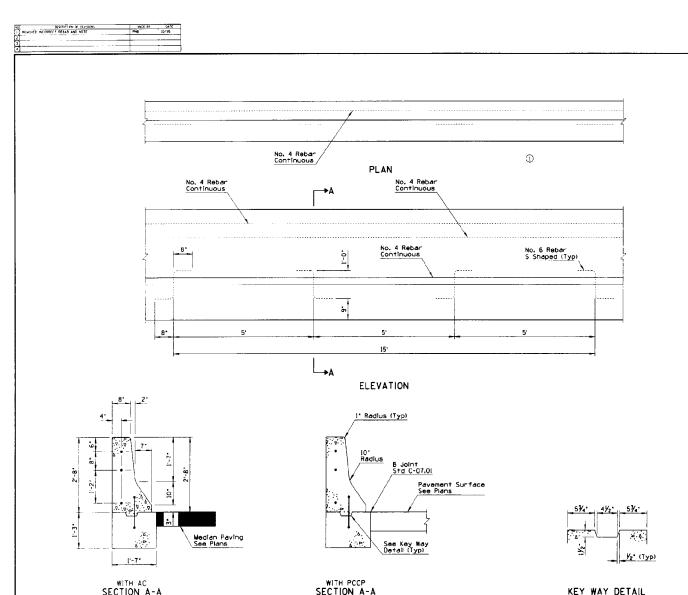






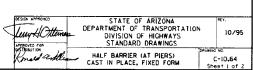


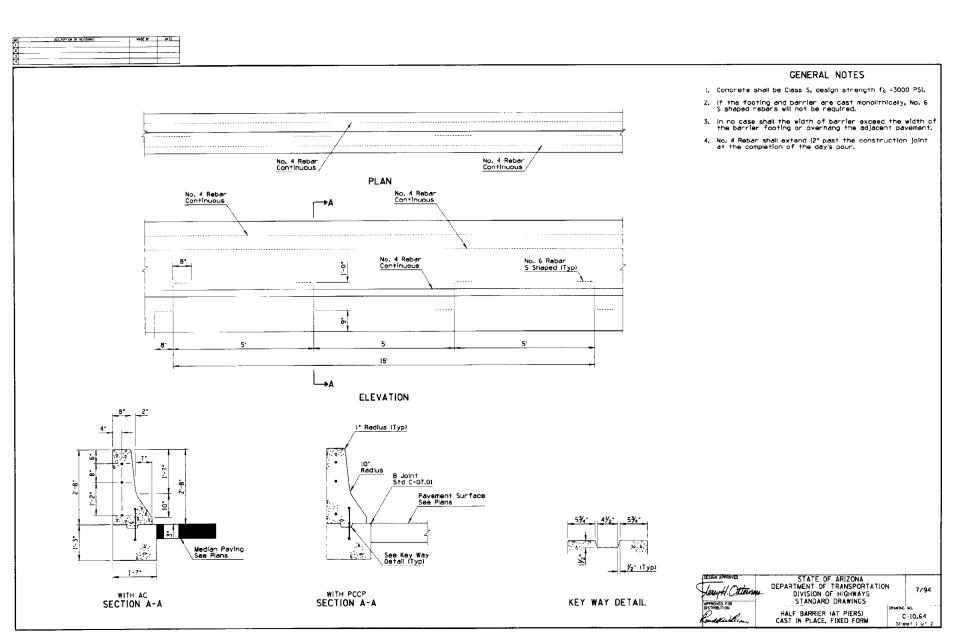


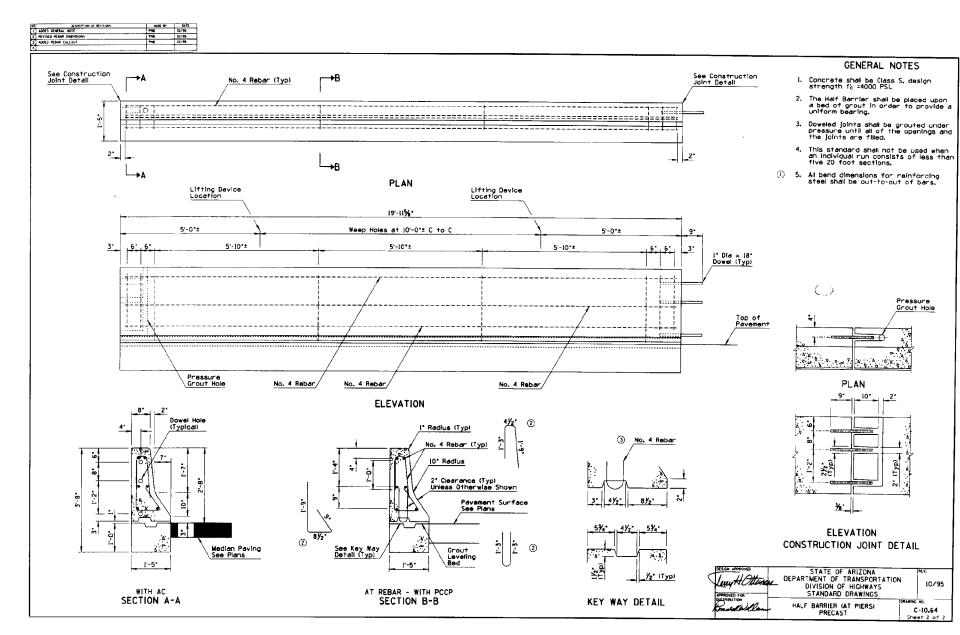


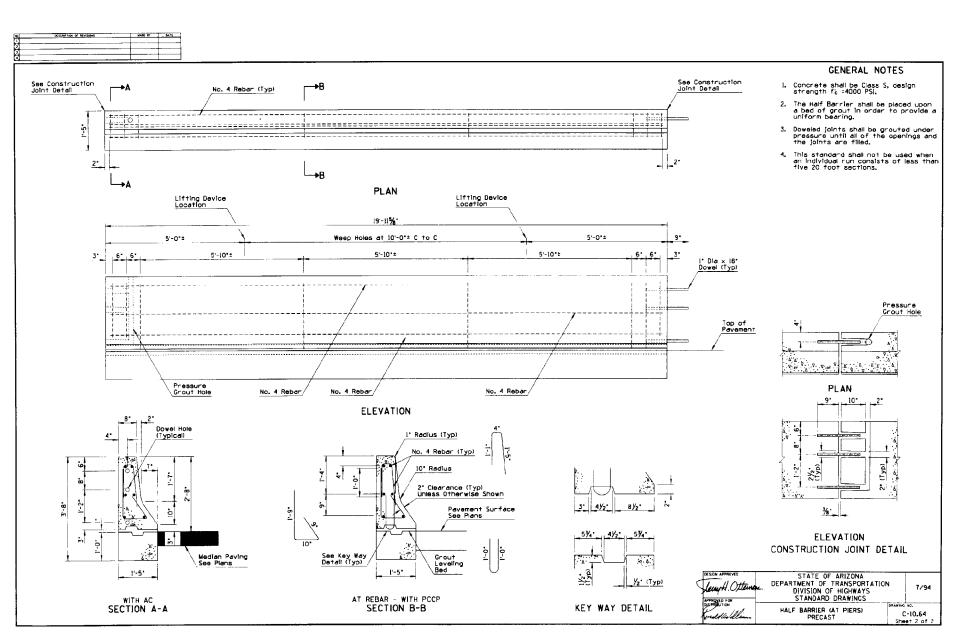
GENERAL NOTES

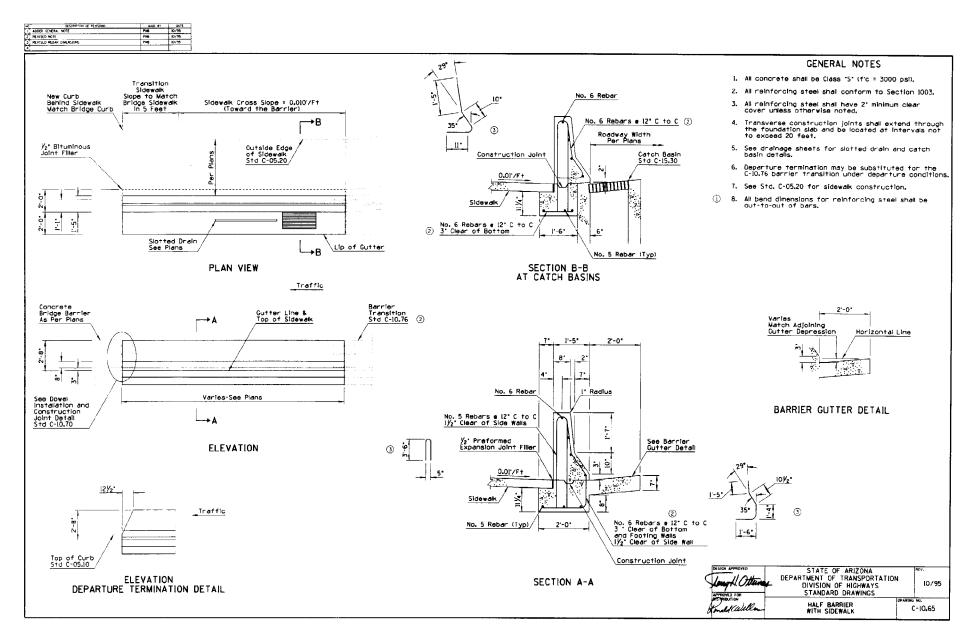
- 1. Concrete shall be Class S, design strength fig =3000 PSI.
- If the footing and barrier are cast monolithically, No. 6 S shaped rebars will not be required.
- In no case shall the width of barrier exceed the width of the barrier footing or overhang the adjacent pavement.
- No. 4 Rebar shall extend 12 past the construction joint at the completion of the day's pour.

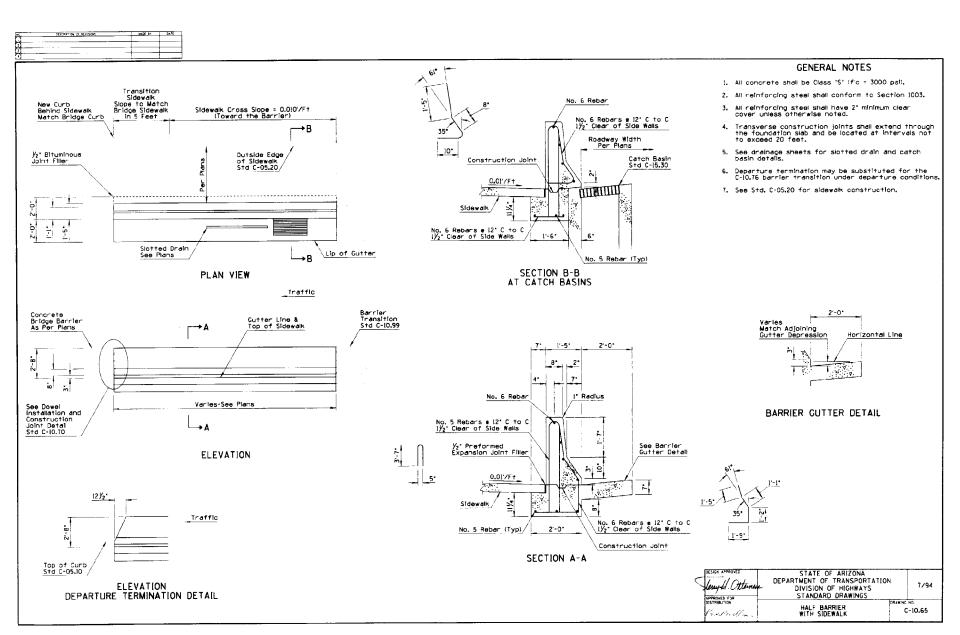


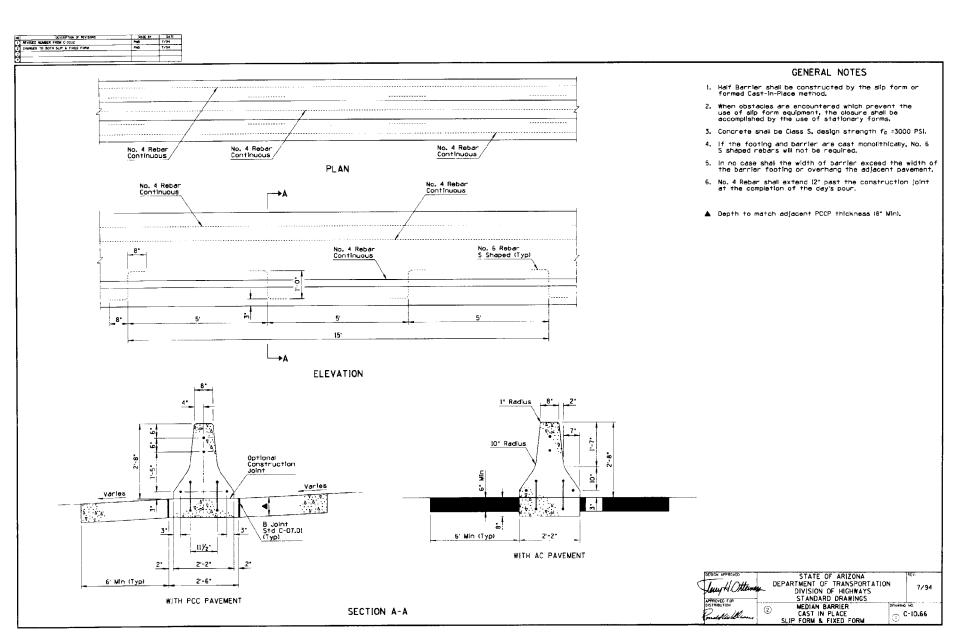


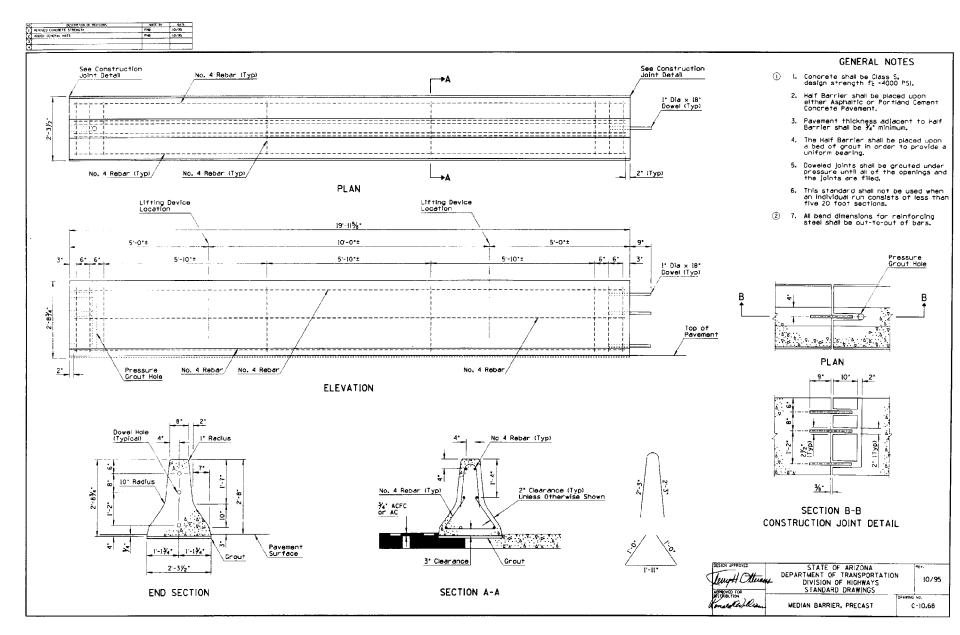


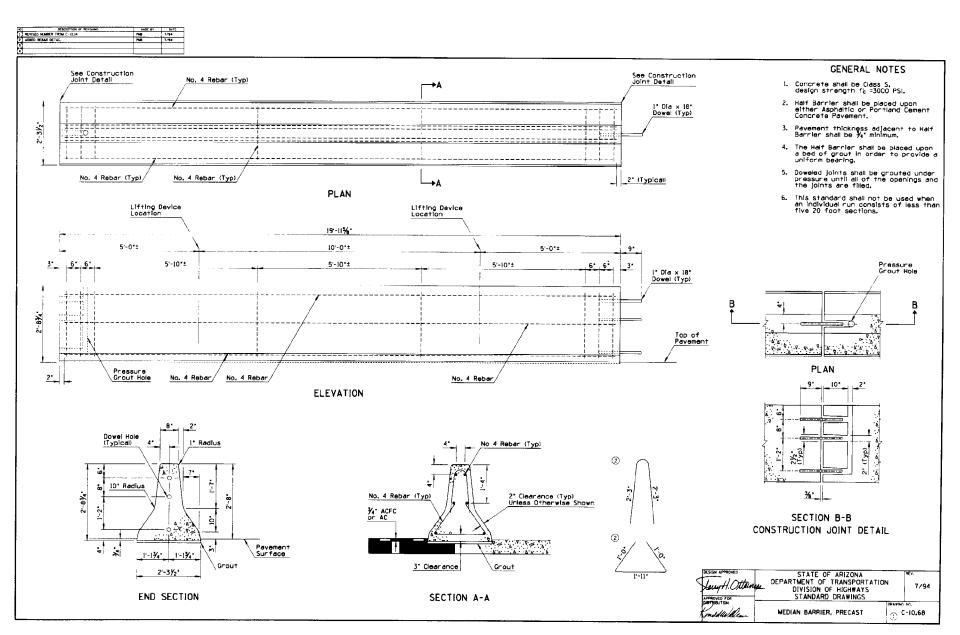


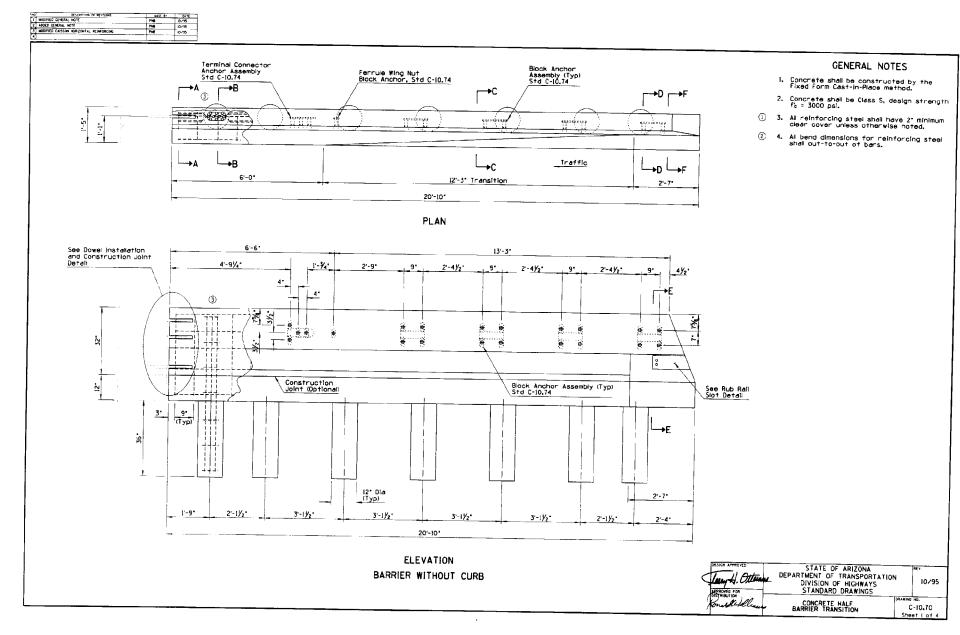


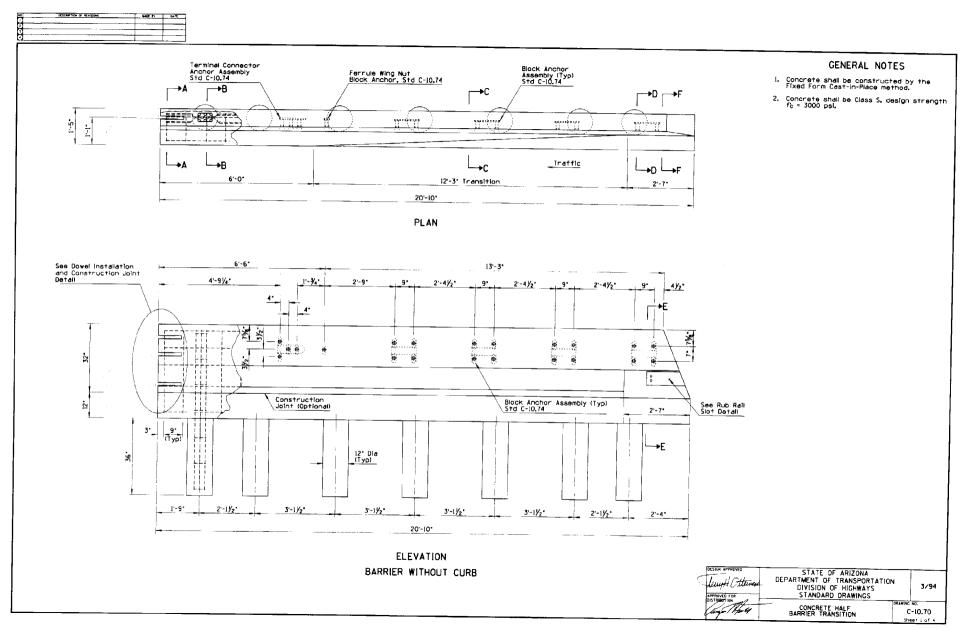


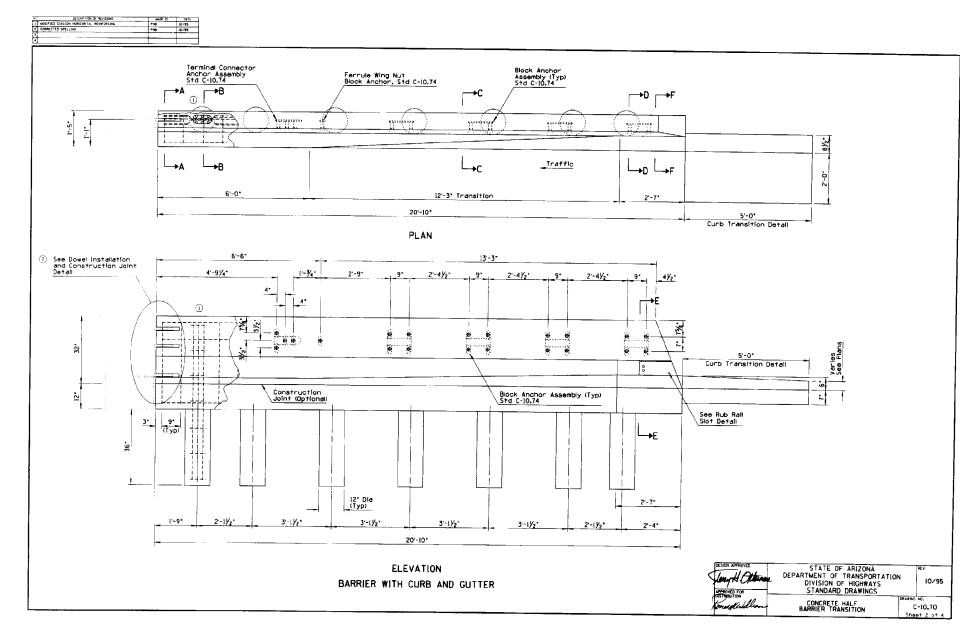


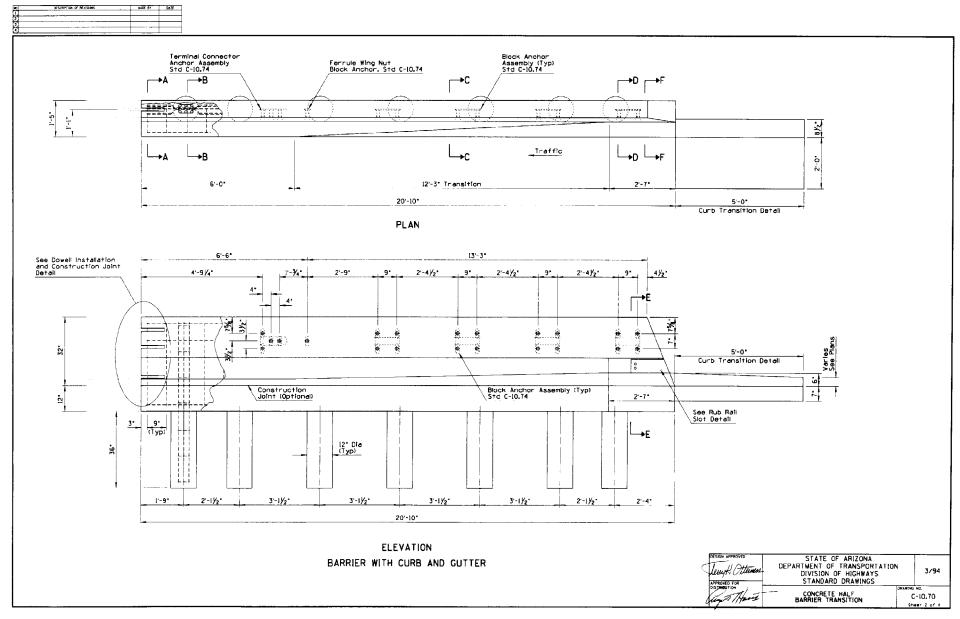


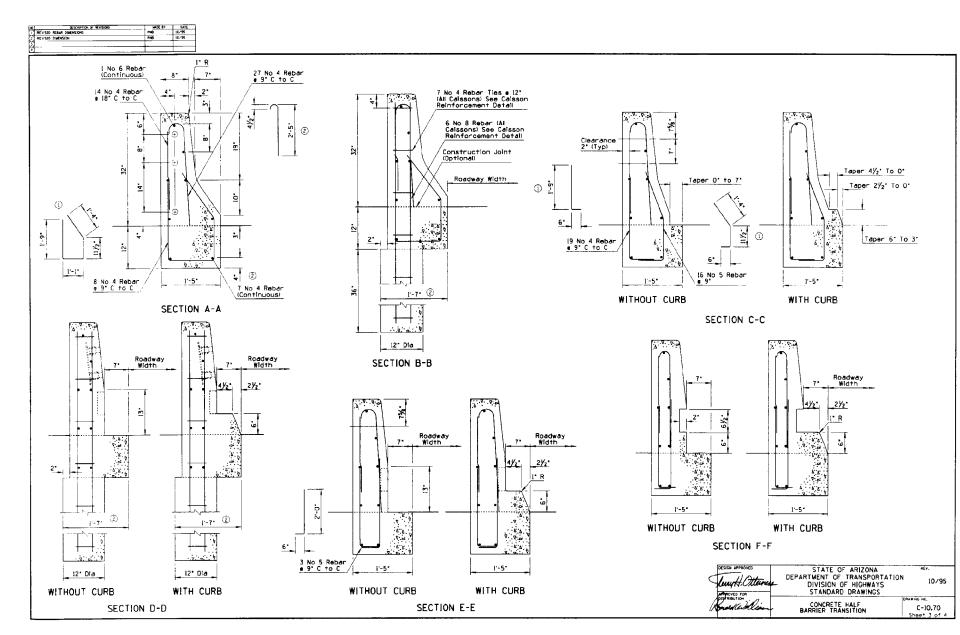


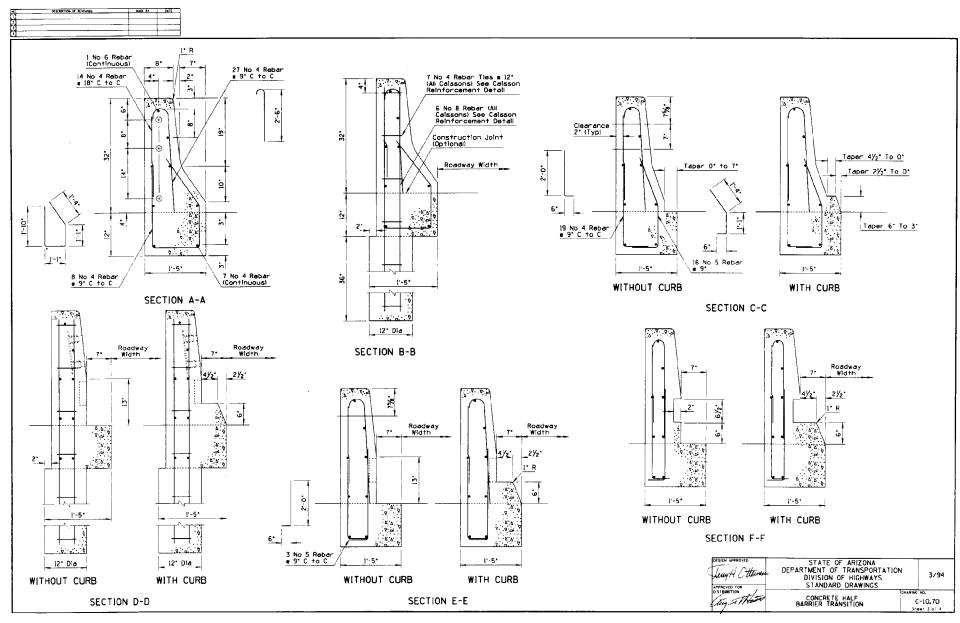




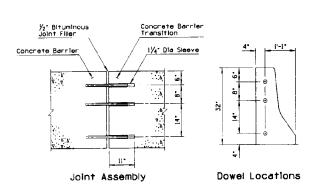




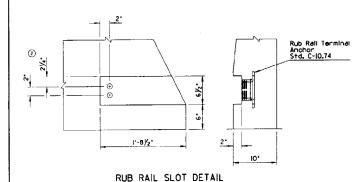


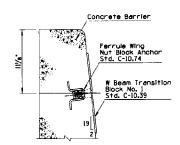




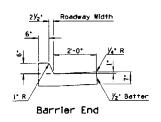


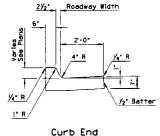
DOWEL INSTALLATION AND CONSTRUCTION JOINT DETAIL



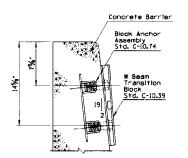


BLOCK AND ANCHORAGE HALF BARRIER (BLOCK I SHOWN)

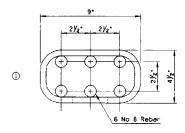


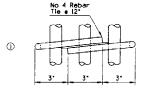


CURB TRANSITION DETAIL



BLOCK AND ANCHORAGE HALF BARRIER (BLOCK 2 SHOWN)

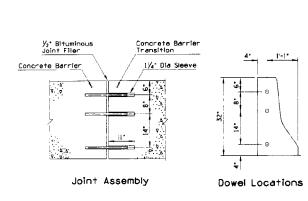




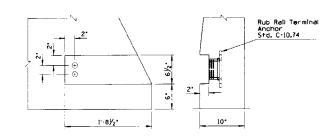
CAISSON REINFORCEMENT

APPROVED FOR PRESTABILITION	CONCRETE HALF BARRIER TRANSITION	C	C-10-70 Sheet 4 of 4	
Levy HOtterness	DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		10/95	
DESIGN APPROVED	STATE OF ARIZONA		REV.	

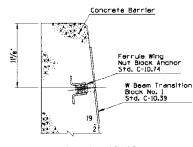




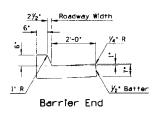
DOWEL INSTALLATION AND CONSTRUCTION JOINT DETAIL

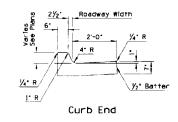


RUB RAIL SLOT DETAIL

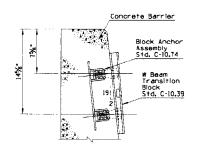


BLOCK AND ANCHORAGE HALF BARRIER (BLOCK | SHOWN)

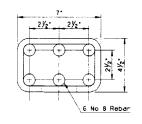


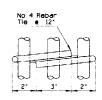


CURB TRANSITION DETAIL



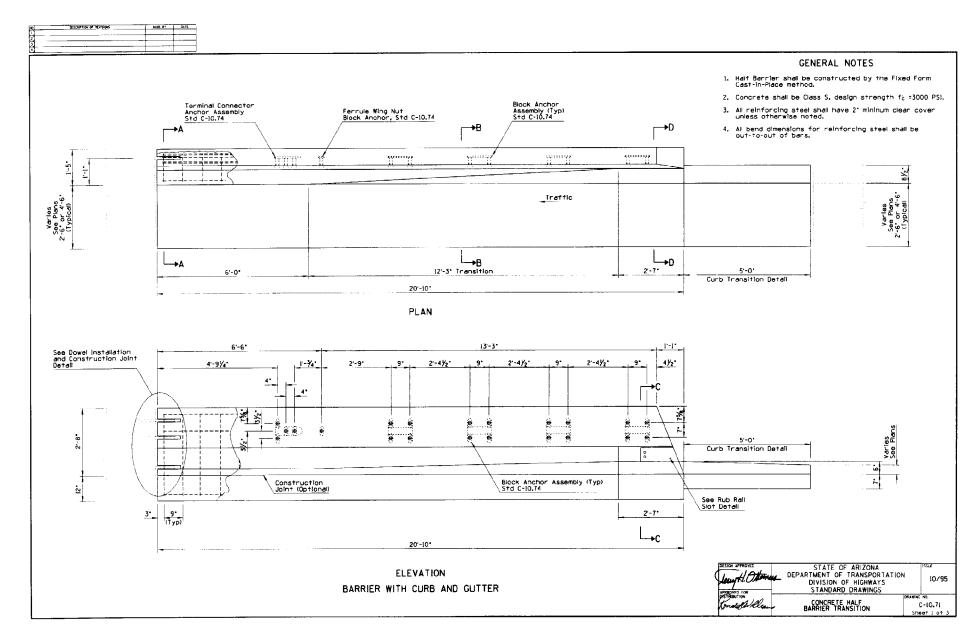
BLOCK AND ANCHORAGE HALF BARRIER (BLOCK 2 SHOWN)

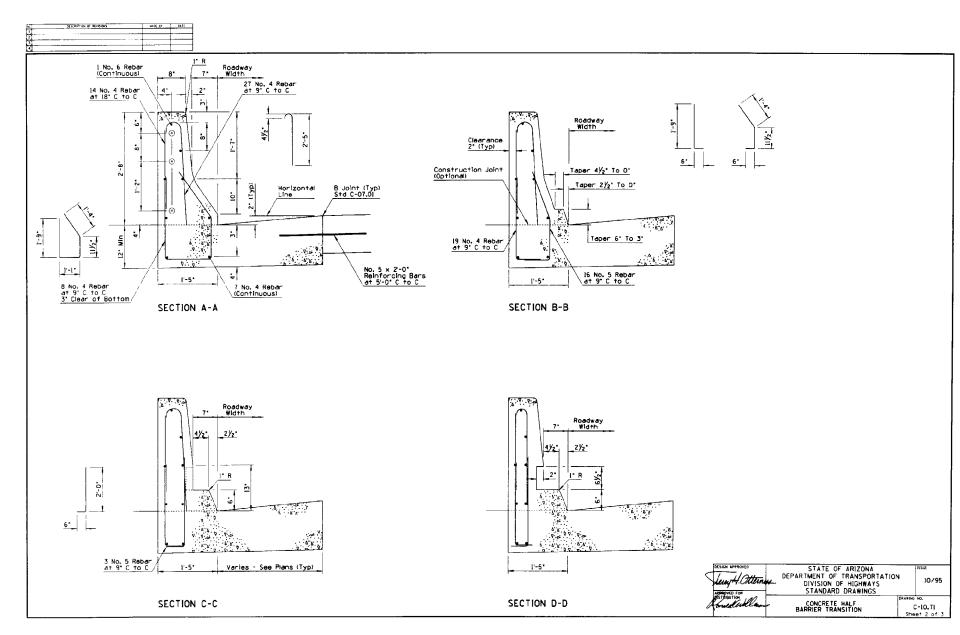




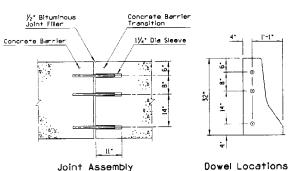
CAISSON REINFORCEMENT

DESIGN APPROVED LEMY H. CHEMEN APPROVIGEOR	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		3/94
Mineral Phanes	CONCRETE HALF BARRIER TRANSITION	C-10.70	

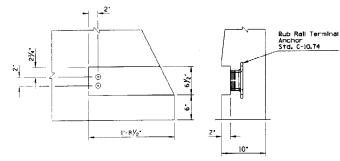




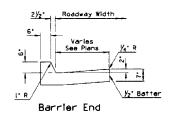


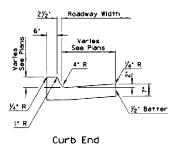


DOWEL INSTALLATION AND CONSTRUCTION JOINT DETAIL

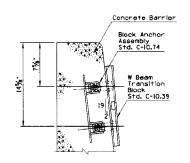


RUB RAIL SLOT DETAIL

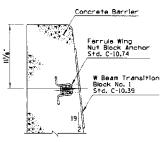




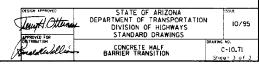
CURB TRANSITION DETAIL



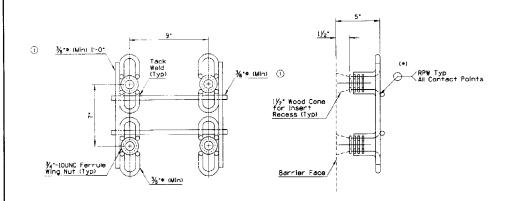
BLOCK AND ANCHORAGE HALF BARRIER (BLOCK 2 SHOWN)



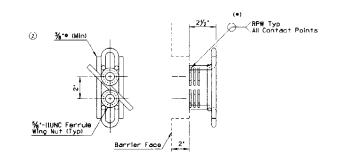
BLOCK AND ANCHORAGE HALF BARRIER (BLOCK 1 SHOWN)



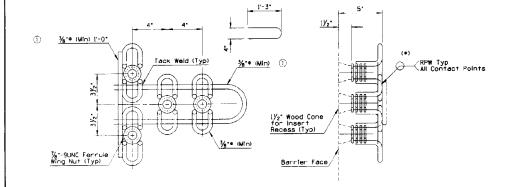




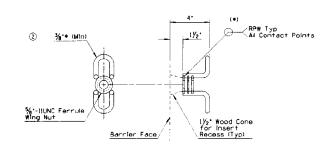
BLOCK ANCHOR ASSEMBLY



RUB RAIL TERMINAL ANCHOR

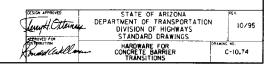


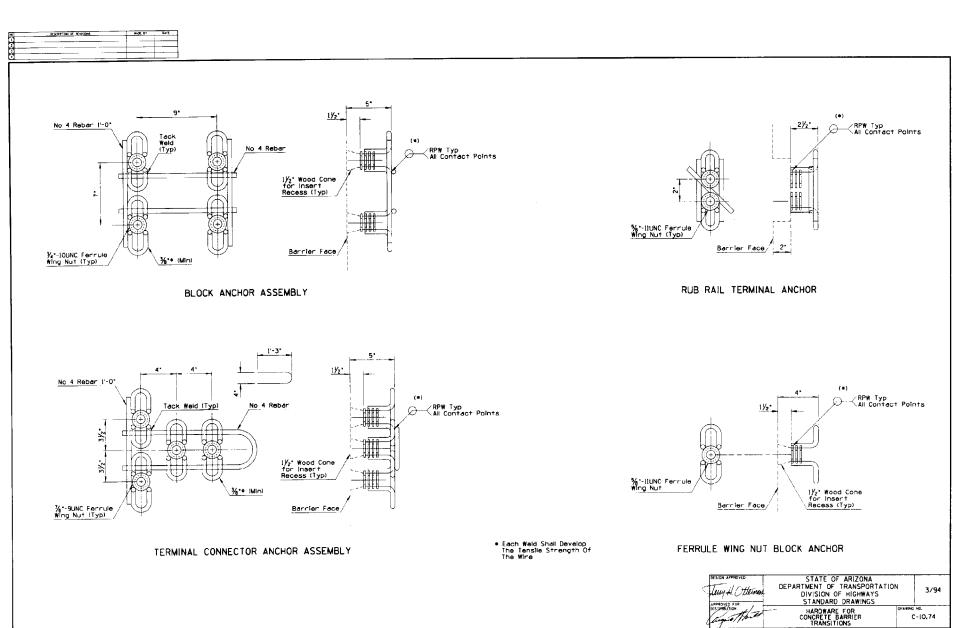
TERMINAL CONNECTOR ANCHOR ASSEMBLY



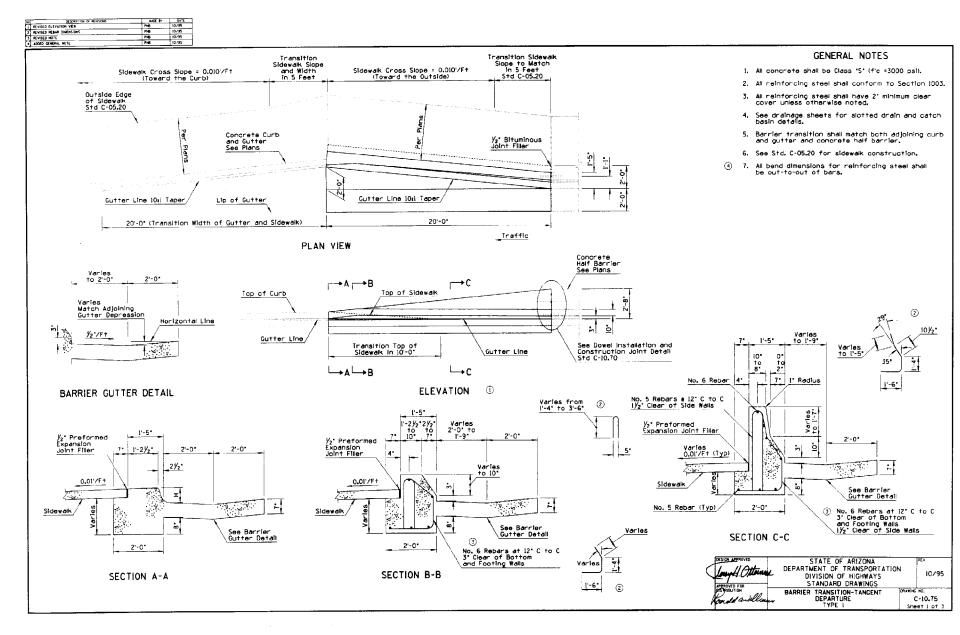
FERRULE WING NUT BLOCK ANCHOR

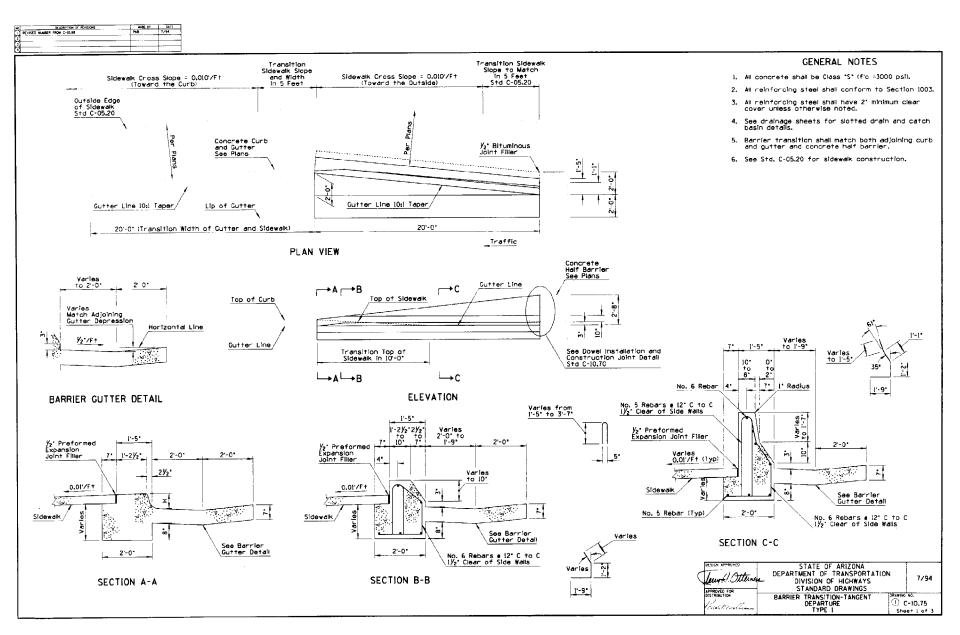
 Each Wold Shall Develop The Tensile Strength Of The Wire

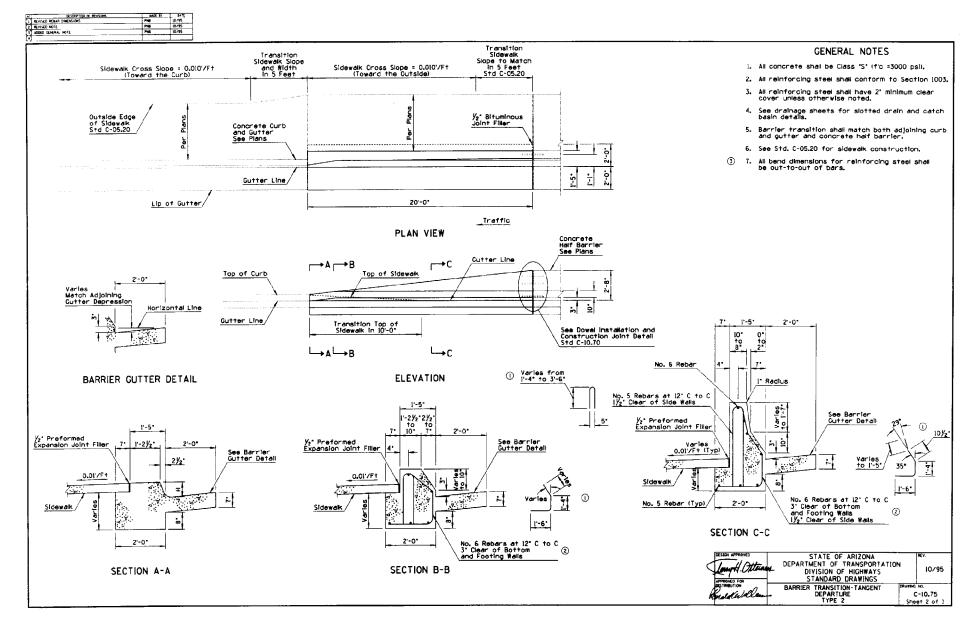


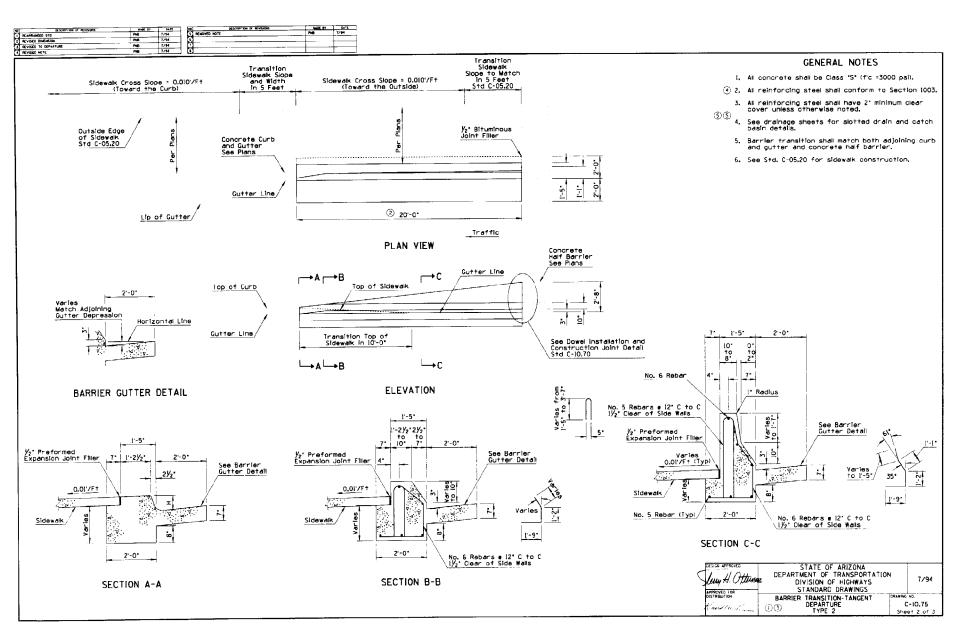


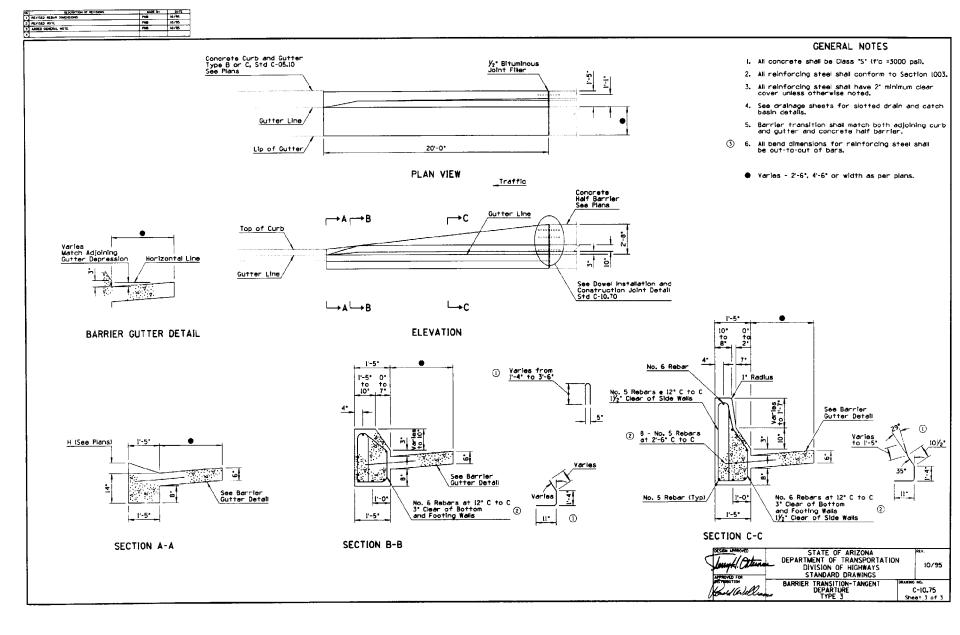
C-10,74

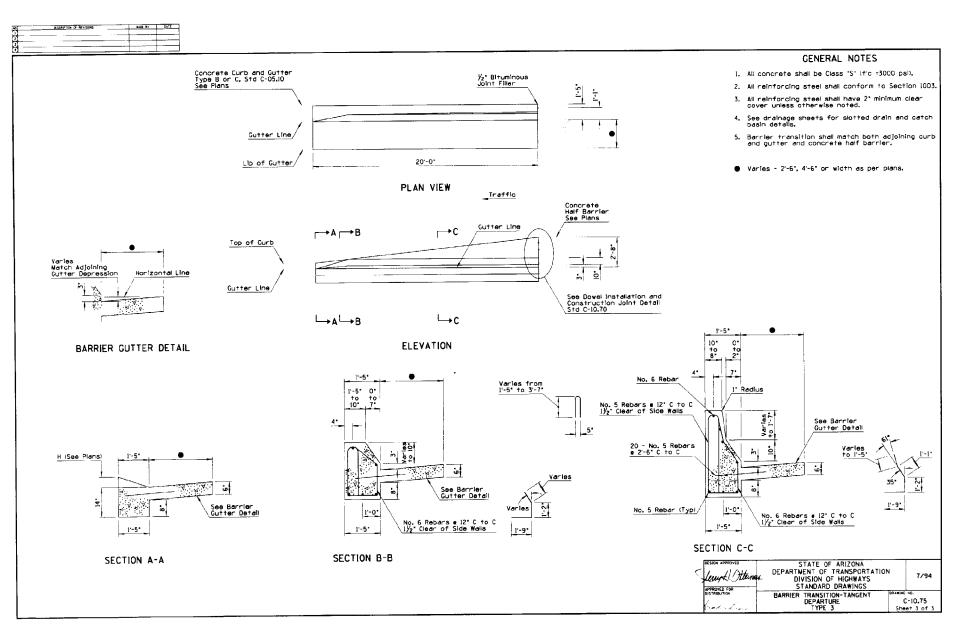


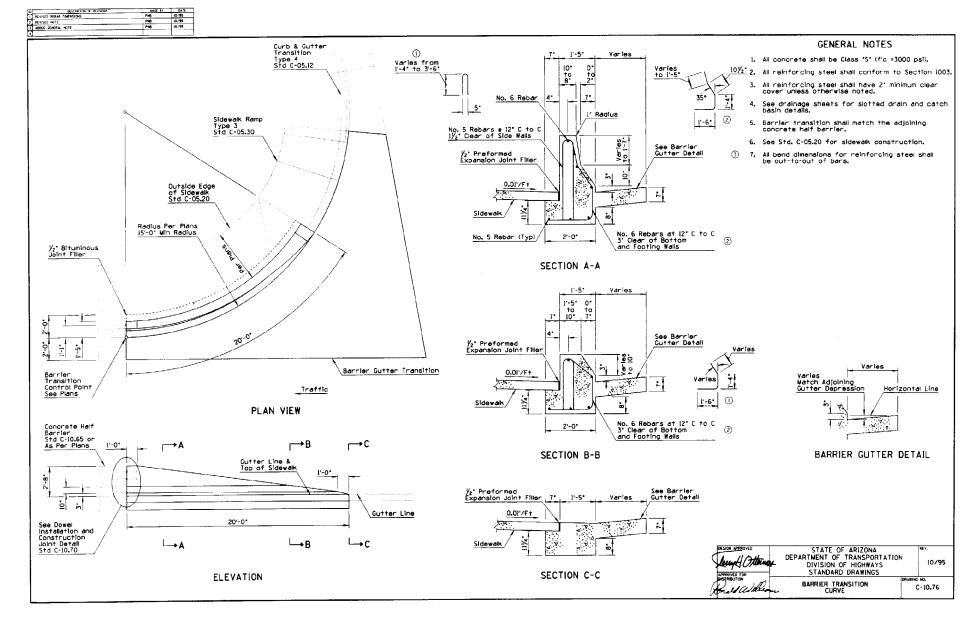


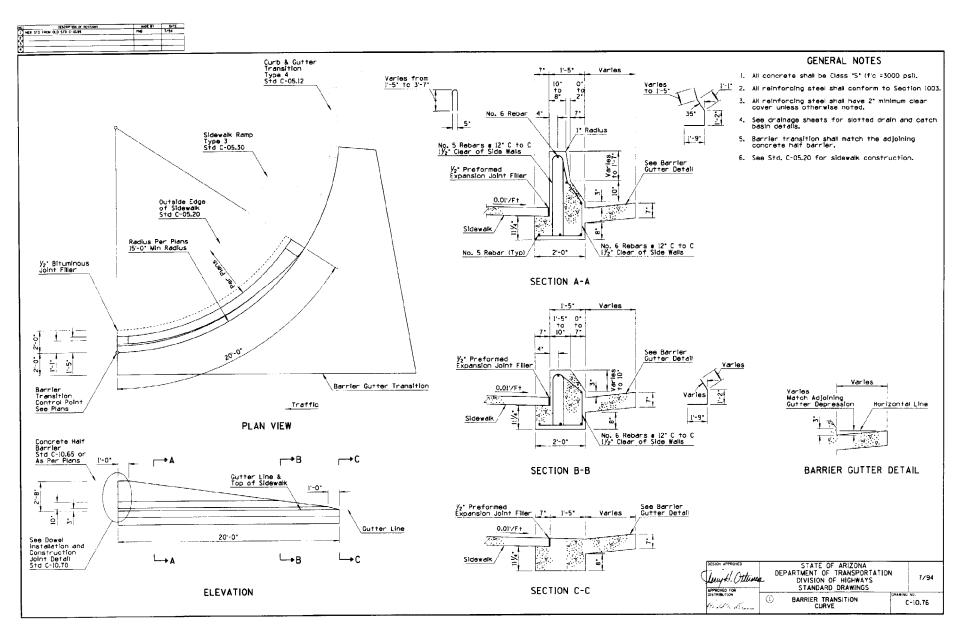


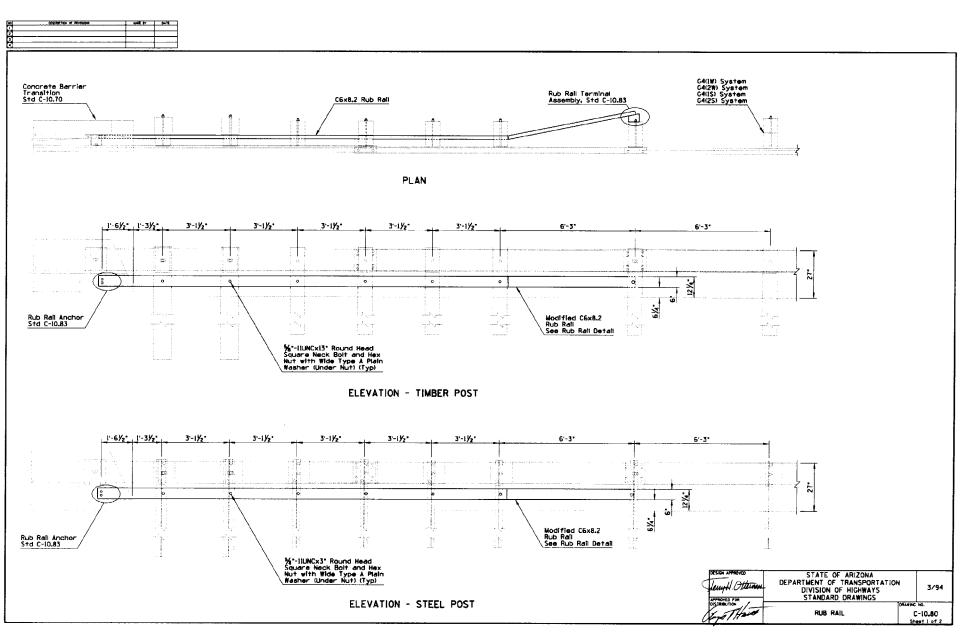


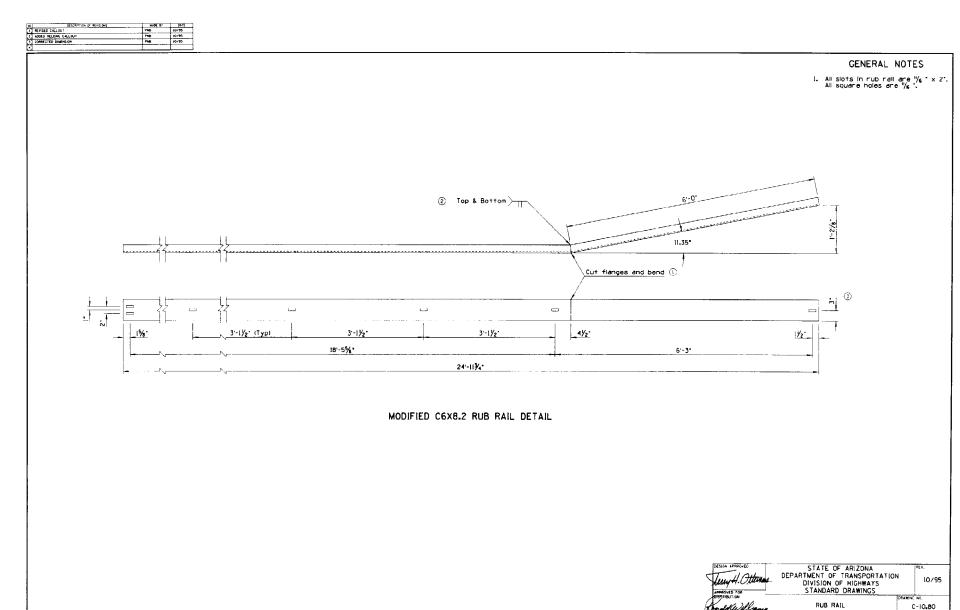


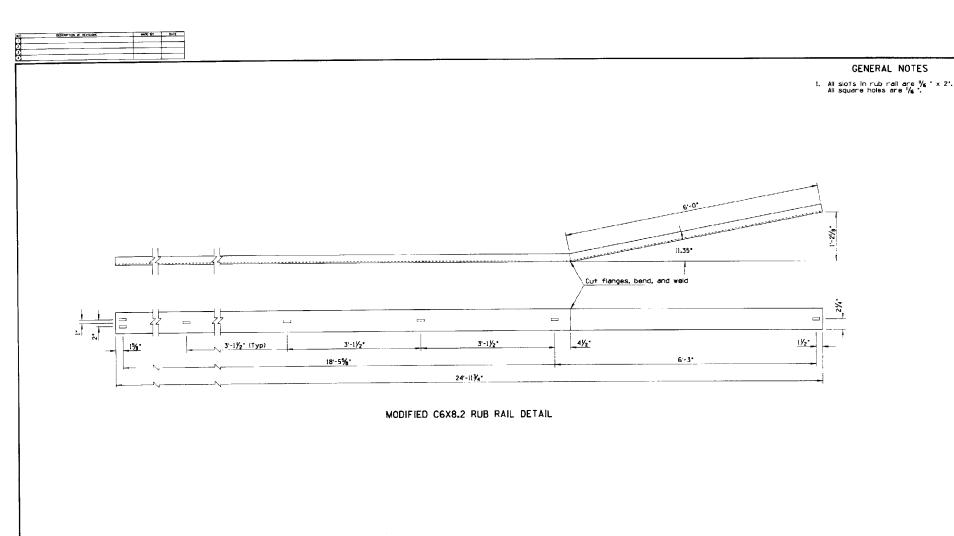








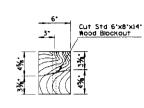




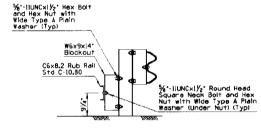
STANDARD DRAWII

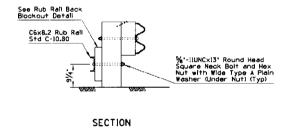
C-10.80 Sheet 2 of 2



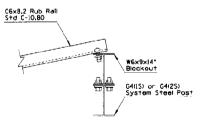


PLAN RUB RAIL BACK BLOCKOUT DETAIL





C6x8.2 Rub Rall Std C-10.80 Rub Rail Back Blockout G4(IW) or G4(2W) System Wood Post ferrisin in the state of the st

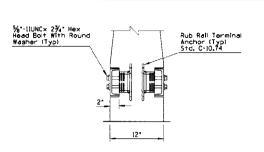


SECTION

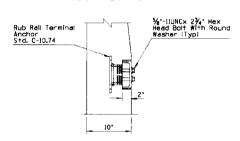
PLAN STEEL POST

PLAN TIMBER POST

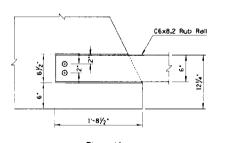
RUB RAIL TERMINAL ASSEMBLY



Median Barrier

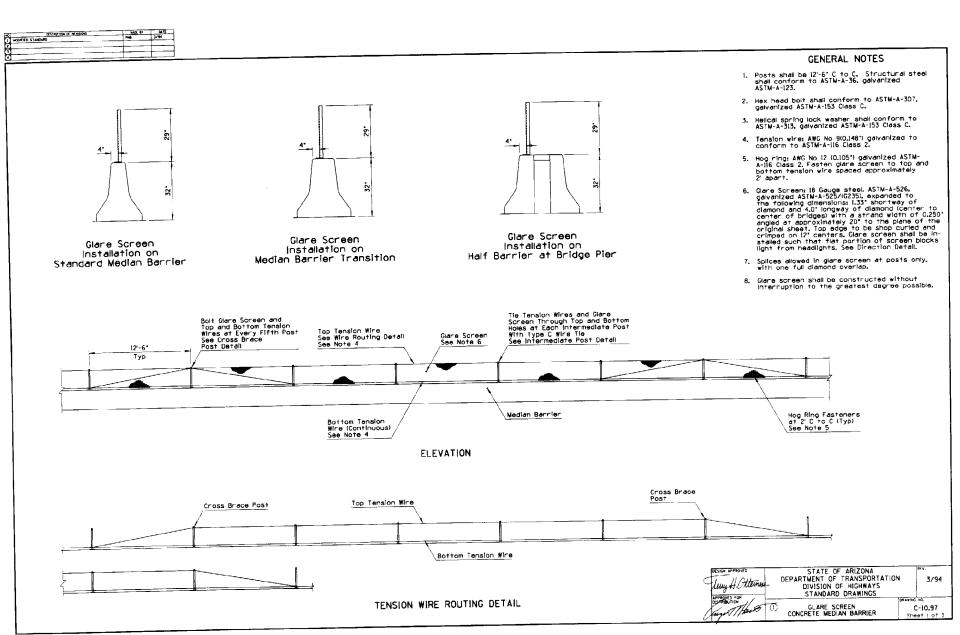


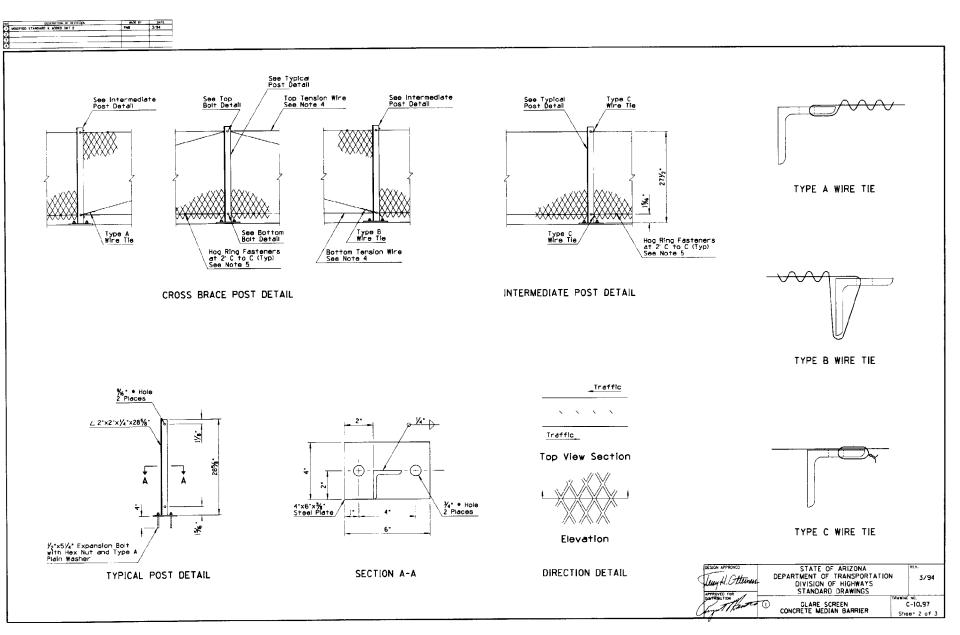
Half Barrier



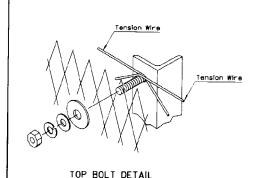
Elevation RUB RAIL ANCHOR

LELLY H OTHER	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	1	3/94
DISTRIBUTION	HARDWARE FOR	DFAMING C	но. С-10 .83

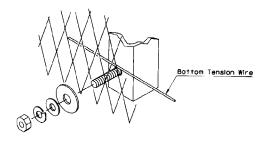




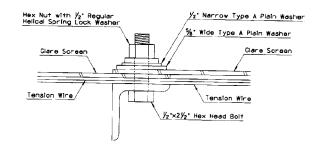




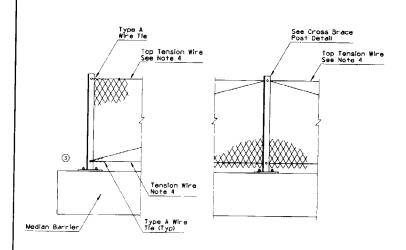


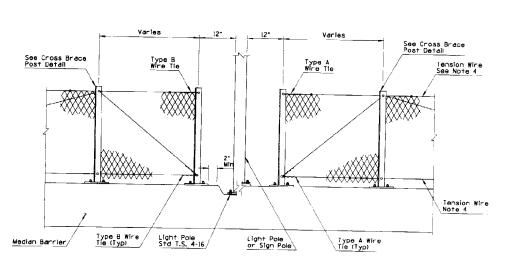


BOTTOM BOLT DETAIL



② TOP BOLT SECTION





TERMINATION DETAIL

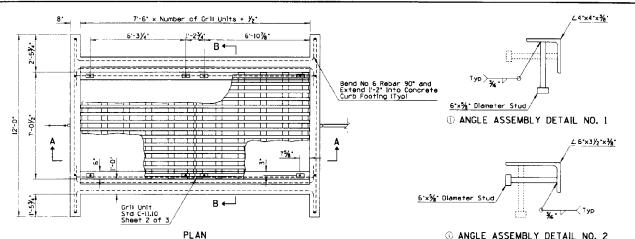
OBSTRUCTION DETAIL

DEPARTMENT OF TRANSPORTATION
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS
GLARE SCREEN
CONCRETE MEDIAN BARRIER

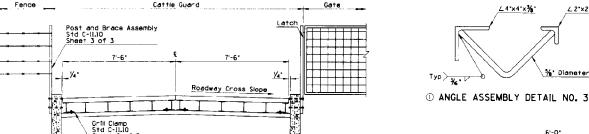
3/94

C-10.97 Sheet 3 of 3



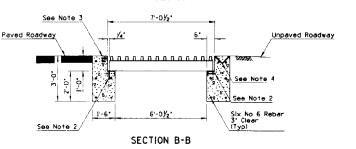


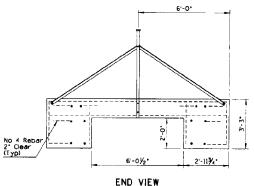




SECTION A-A

Sheet 2 of 3





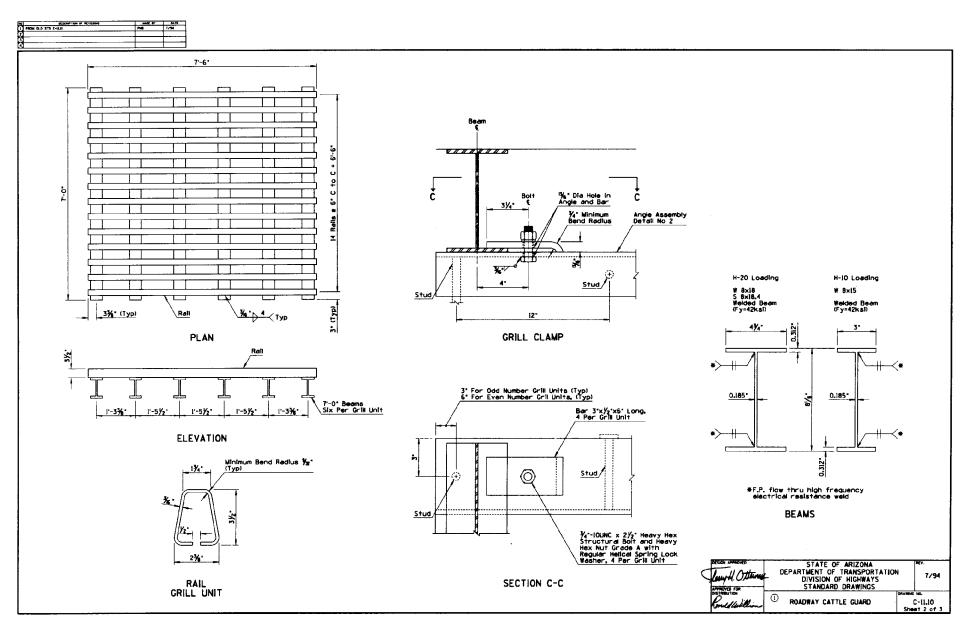
75.x5.x3.

%' Diameter Stud

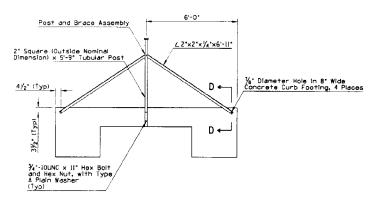
- Cattle guard shall be sloped to conform to the roadway grade and cross section, except that where an odd number of grill units is specified in a crowned roadway, the center grill unit shall have a level cross slope.
- 3 2. Crii units shall be set on an angle assembly consisting of one 6x3/2x4 angle and % diameter studs with head. The studs shall be picked on :-0 diernate centers. See Angle Assembly
 - Where the adjacent roadway is paved, an angle assembly shall consist of one 4'x4'x% angle and % diameter studs with hoad. The studs shall be placed on 1-0' affernate centers. See Angle Assembly Detail No. 1.
 - 4. Where the adjacent roadway is unpaved, an angle assembly shall consist of one 4x4x½ angle and one 2x2x½ angle and connected with ½ diameter studs. The assembly shall be crowned at the centerine and constructed with a bevelout and welded, the study shall be bent 90 and placed on I'-D' centers. See Angle Assembly Detail No. 3.
 - Each angle and angle assembly shall be fabricated to form a single piece for the full length of the cattle guard.
 - 6. Quantities shown for concrete and reinforcing bars are to be considered approximations for informational purposes only.
 - 7. When guard rail is to be used at the cattle guard, it may be possible to reduce the number of grill units required,

	UNIT	TABLE	
Roadway Width (Feet)	Grill Units Required	Concrete Cubic Yards	Rebar Lbs
12	2	5. 8	173.3
16	3	8.0	240.9
20	4	10.3	308.5
28	5	12.5	375.1
34	6	14.7	443.7
36	6	14.7	443.7
38	7	16.9	511.2
40	7	16.9	511.2

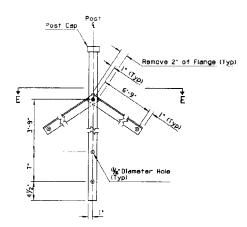
DESIGN APPROVED LEWELL OTTURES	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/ 94
Poseletalla	ROADWAY CATTLE GUARD	NO. C-11.10 et 1 of 3







END VIEW



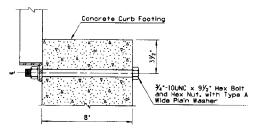
POST AND BRACE ASSEMBLY



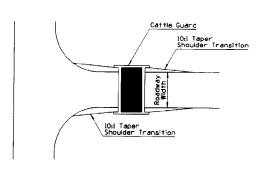
SECTION E-E

GENERAL NOTES

 Material for shoulder transition shall be placed to the finished roadway elevation for the entire length of the transition. When the roadway is paved, Aggregate Subbase or Aggregate Base shall be used. When Roadway is unpaved, a material squivalent to the existing roadway shall be used.

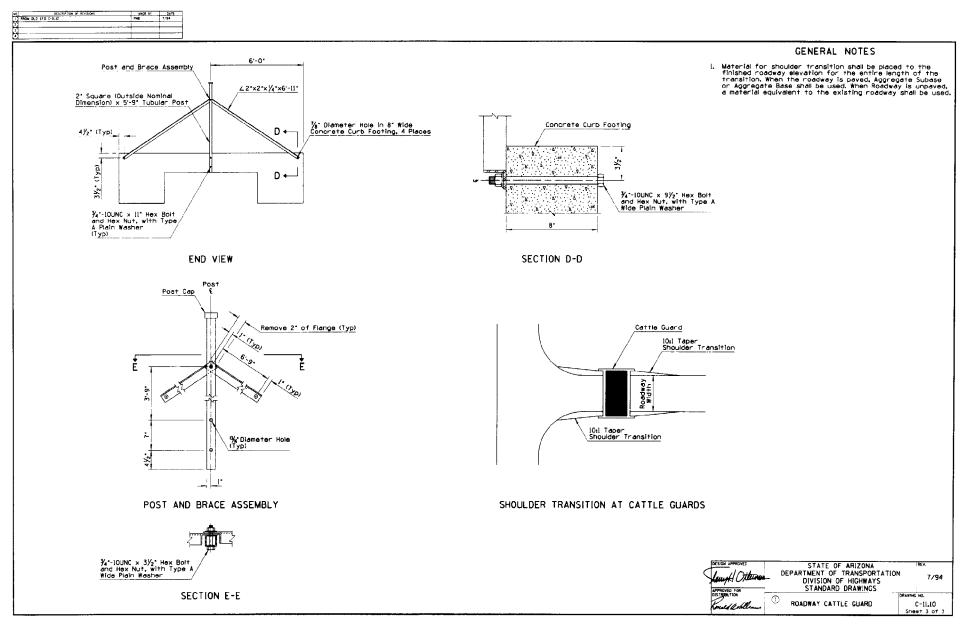


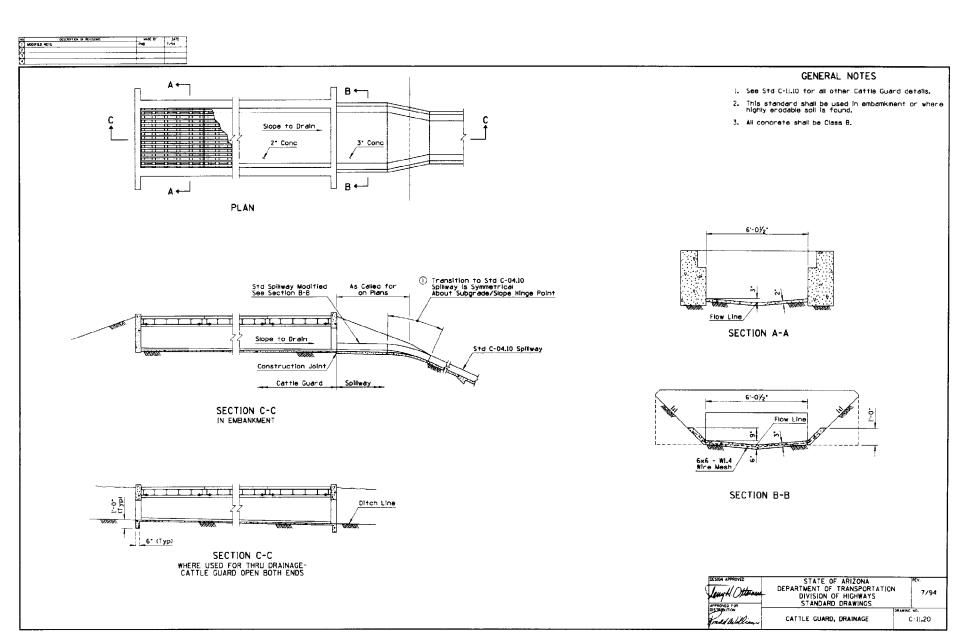
SECTION D-D

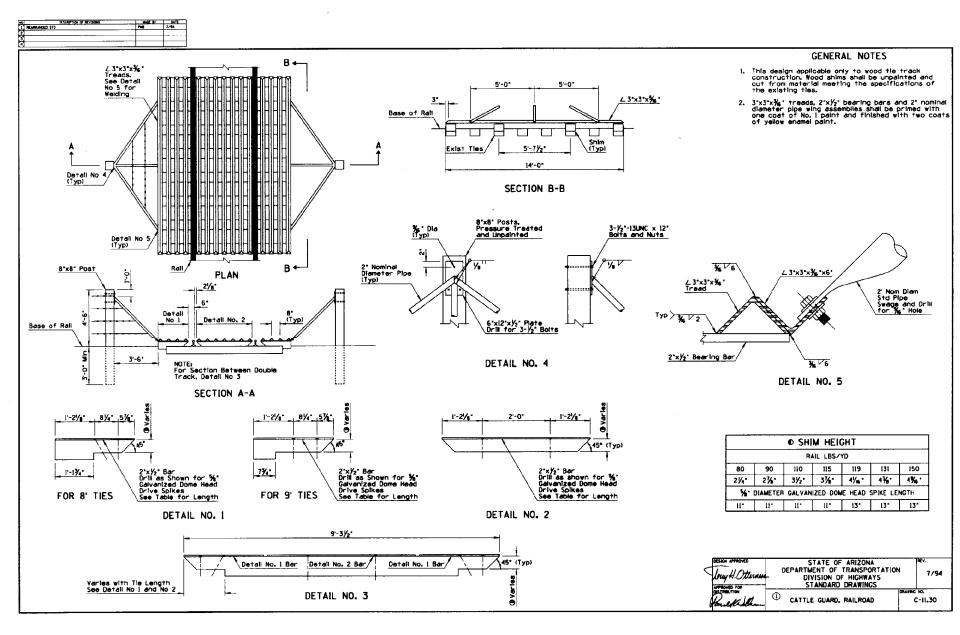


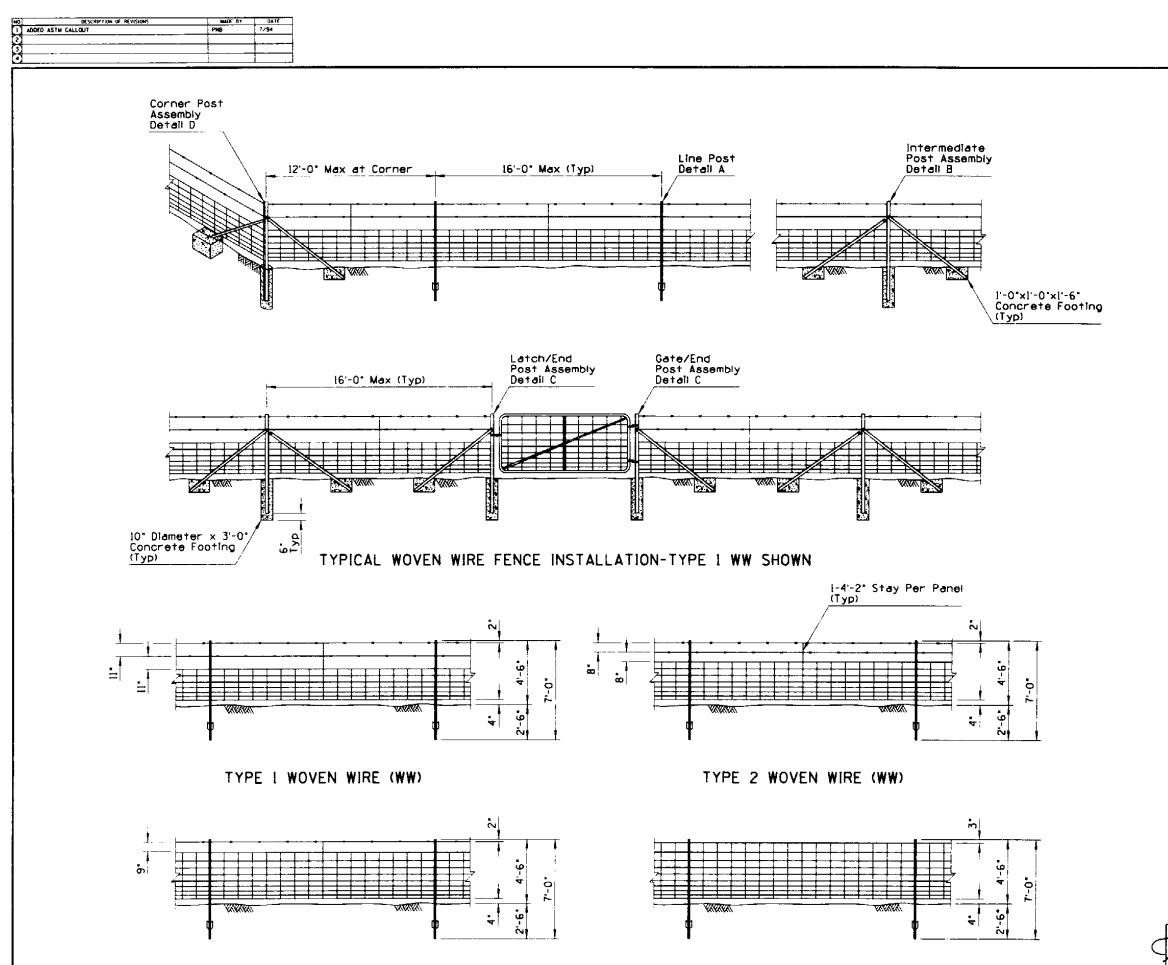
SHOULDER TRANSITION AT CATTLE GUARDS

DESIGN APPROVED LEWYH Otterney APPROVED FOR DISARBILITION	STATE OF ARIZONA DEPARTMENT OF TRANSPORTAT DIVISION OF HIGHWAYS STANDARD DRAWINGS	 10/95
Ronald Man	ROADWAY CATTLE GUARD	NO. C-11a1O et 3 of 3





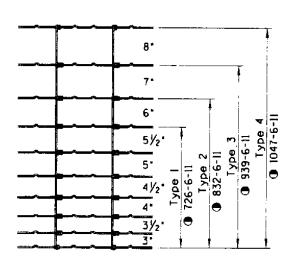




TYPE 4 WOVEN WIRE (WW)

TYPE 3 WOVEN WIRE (WW)

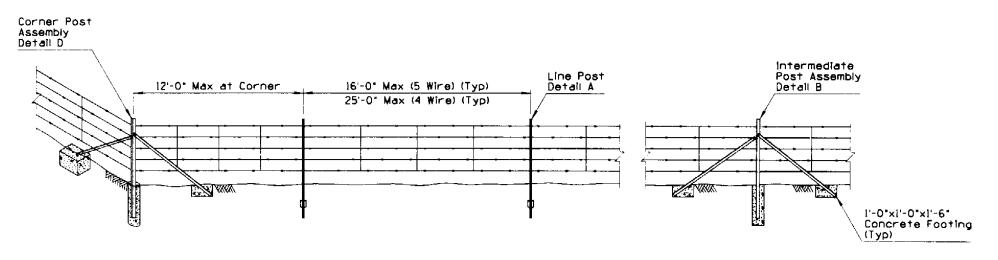
- Length of post and braces shall not be less than 7'-0".
- Woven wire fence fabric shall be attached to the post at the top, bottom, and intermediate wires.
- Intermediate Post Assemblies shall be located as shown and at intervals to utilize standard rolls to minimize cutting and waste.
- A twisted wire stay shall be centered between posts.
- 1 ASTM design number

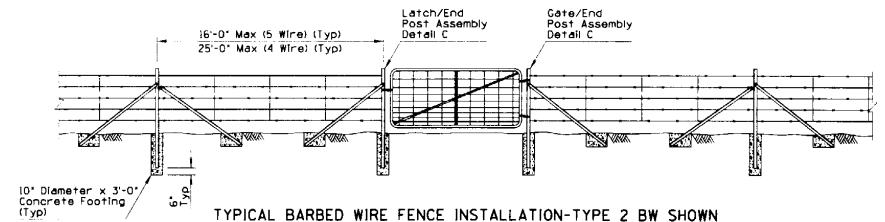


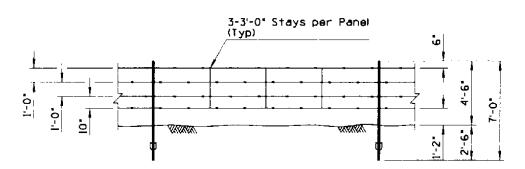
FENCE FABRIC DIMENSIONS AND DESIGN NUMBERS

LEWHOTELLER	STATE OF ARIZONA DEPARTMENT OF TRANSPORTA DIVISION OF HIGHWAYS STANDARD DRAWINGS	TION	7/94
oned Williams	FENCE, WOVEN WIRE		No. C-12.10 Set 1 of 5

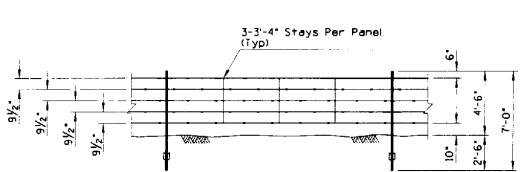




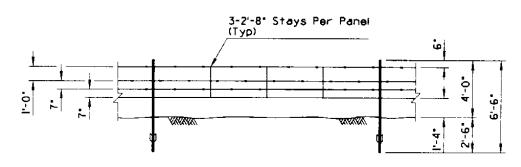




TYPE 1 BARBED WIRE (BW) (4 WIRE)

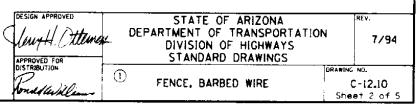


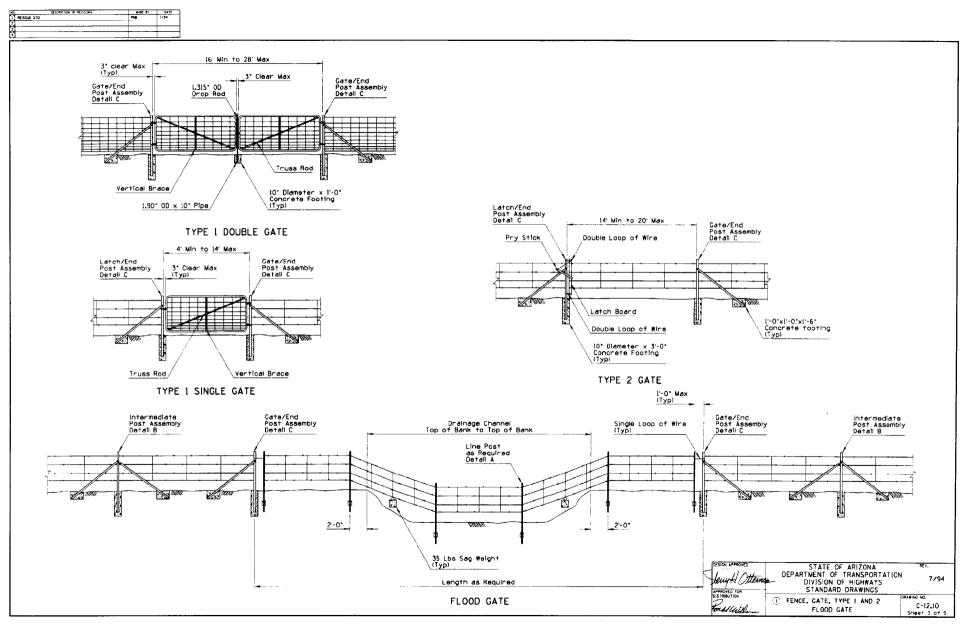
TYPE 2 BARBED WIRE (BW) (5 WIRE)

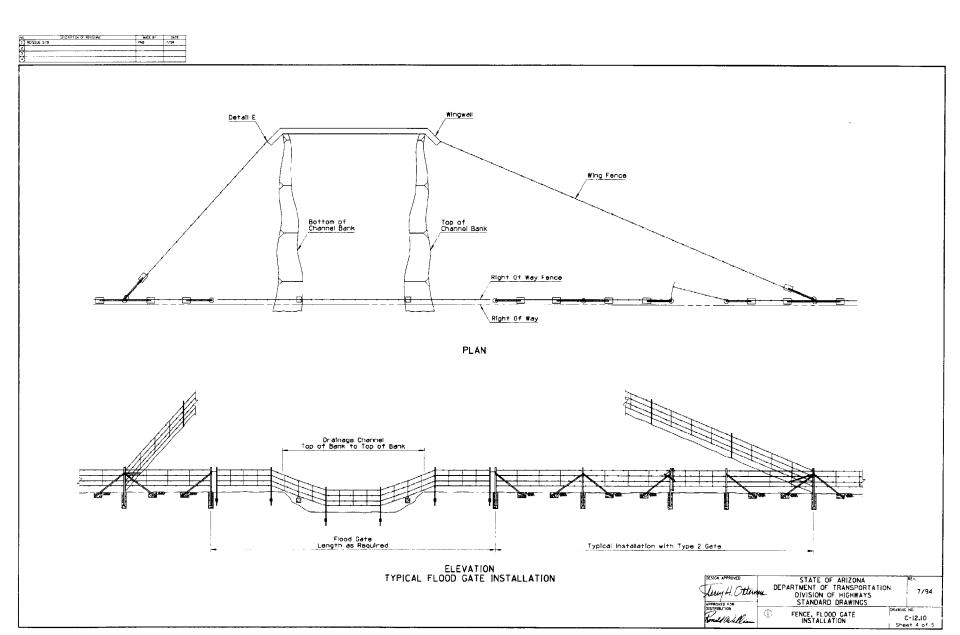


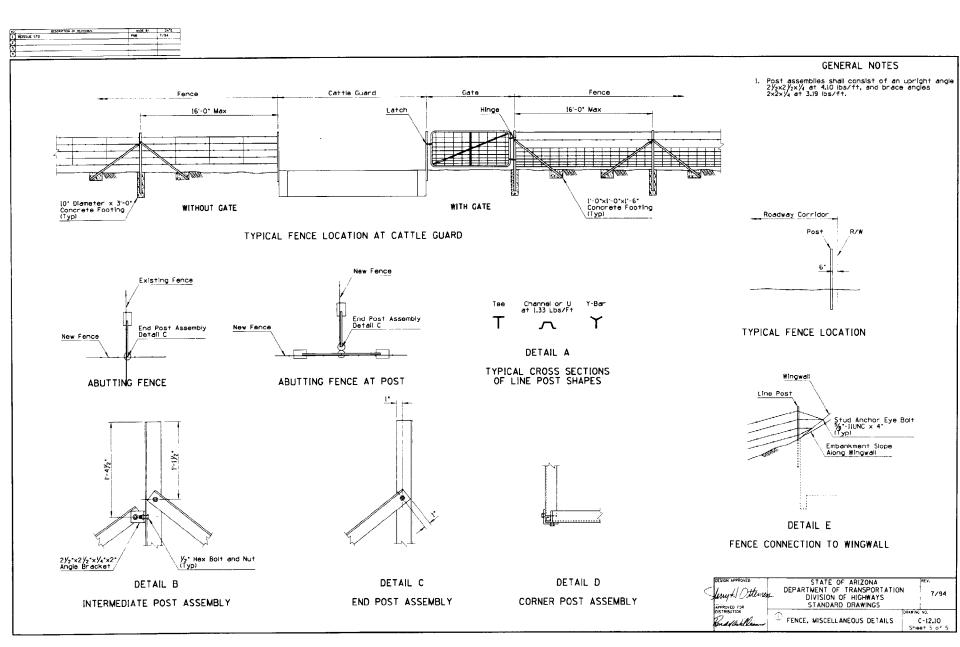
BARBED WIRE GAME FENCE (GF)

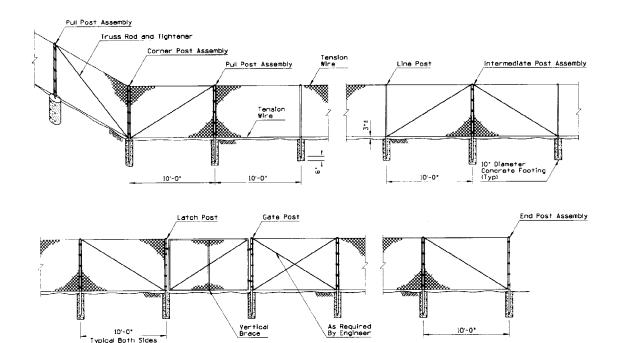
- Intermediate Post Assemblies shall be located as shown and at intervals not to exceed 650', or midway between all braced posts.
- 2. For game fence the bottom wire shall be barbless.
- The stays on game fence shall have their ends turned up, to prevent injuries to game.









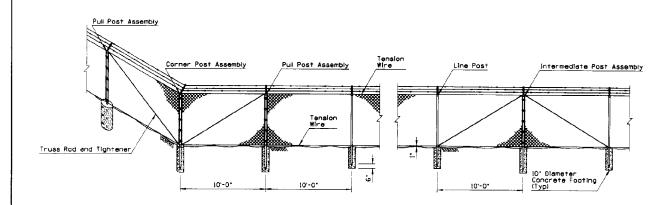


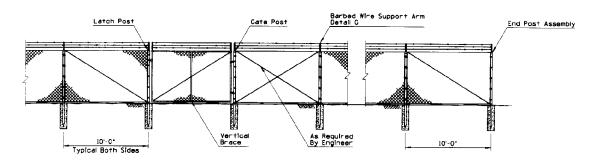
TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE I SHOWN

TYPICAL POST DIMENSIONS								
Fabric Height		end, intermedia ten and Pull Po			Line Posts			
		Round	Roll Fo	ormed		Round		Roll Formed
	Length (0D	(00)	G	Π	Length	(OD)	H-Section	
36*	60.	2.375*	3.50°x3.50°	2.25°×1.70°	5'-6"	1.900*	1.875"x1.625"	1.875"×1.625"
48*	7'-0'	2.375*	3.50"×3.50"	2.25°x1.70°	6'-6"	1.900*	1.875"×1.625"	1.875"×1.625
60.	8'-0'	2.375*	3.50"×3.50"	2.25°×1.70°	7'-6"	1.900*	1.875"×1.625"	1.875"×1.625
72"	9'-0'	2.375*	3.50°×3.50°	2.25"x1.70"	8'-6"	1.900*	1.875"×1.625"	1.875°×1.625°
Over 72	Height +3'-0"	2.875*	3.50"×3.50"	2.50°×2.50°	Height +2'-6"	2.375	2.250*x2.000*	1.875"×1.625"

- Posts shall be round, H-section, or roll-formed and shall conform to the nominal climensional requirements shown on the plans. Dimensional tolerances for all shapes shall be according to ASTM A-500. In addition, the material of which posts are fabricated shall have a nominal thickness, before galvanizing, of not less than 0.111' for line posts and 0.130' for terminal posts.
- 2. Chain link fabric shall be either zinc-coated or aluminum-coated steel wire fence fabric. Zinc-coated steel fabric shall conform to the requirements of ASTM A392, Class I coating, Aluminum-coated steel fabric shall conform to the requirements of ASTM A491, with a minimum weight of coating of 0.40 ounce per square foot of wire surface area. Fabric shall be Il guage for all fence fabric 60 inches or less in height and shall be 9 guage for fabrics greater than 60 inches in neight.
- Tension wires shall be 7 guage (0,177 inch diameter) coll spring steel wire with a minimum tensile strength of 75,000 pounds per square inch and shall be zinccoated or aluminum-coated.
- 4. Truss rods shall be $\frac{3}{2}$ inch diameter adjustable rods. Truss tighteners shall have a strap thickness of not less than $\frac{1}{2}$ inch.
- 5. Stretcher bars shall be 1_6 inch by 1_6 inch steel flat bars. Stretcher bar bands shall be 1_8 inch by one inch preformed steel bands.
- 6. Bottom tension wire shall be 3 inches from top of crown on concrete footings.
 - Intermediate post assemblies shall be spaced at 500 foot intervals or midway between pull posts when the distance between such posts is less than 1,000 feet and more than 500 feet.
 - 8. See sheet 3 of 3 for typical fence location.

140	DESCRIPTION OF REVISIONS	18 30AH	DATE
1	MODFIED DIMENSION	P18	3/94
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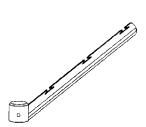




TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 2 SHOWN

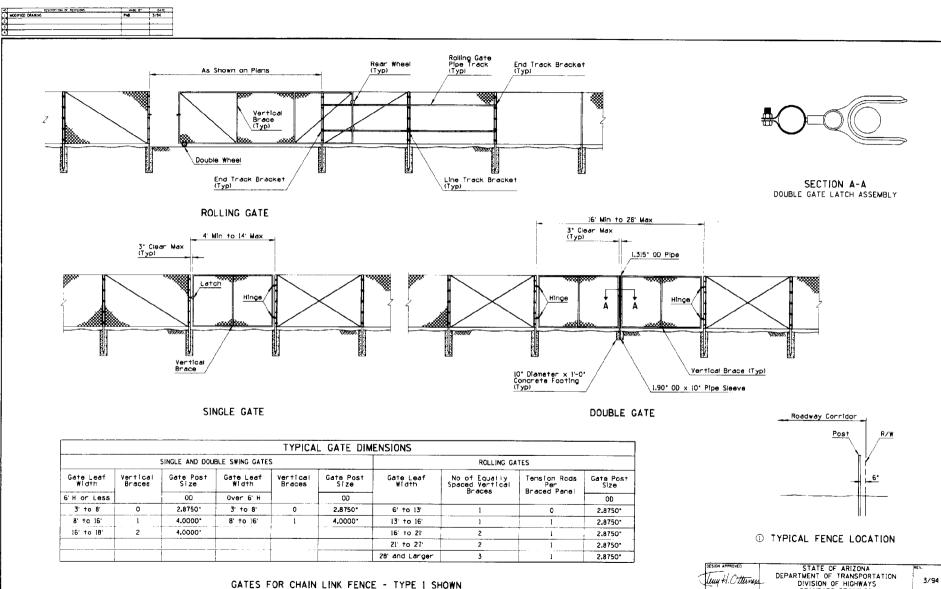
TYPICAL POST DIMENSIONS								
fabric Height			d, Intermedia h and Pull Po		Line Posts			
		Round	Roll Fo	ormed		Round		Rall Formed
	Length	(00)	ے	ם	Length	(00)	H-Section	
72*	① 8:-6*	2.375	3.50"x3.50"	2.50"×2.50"	8'-0"	1.900*	1.875*×1.625*	1.875*x1.625

- Barbed wire for use with Type 2 chain link fence shall be 12 guage steel wire with 4 point 14 guage barbs spaced five Inches apart and shall be either zinc-coated or aluminum-coated. Zinc-coated steel wire shall conform to the requirements of ASTM AI21, Class I coating. Aluminum-coated steel wire shall conform to the requirements of ASTM 1585, Type 1. Class I coating.
- Barbed wire support arm shall be of the type shown on the plans, shall be fabricated from commercial quality steel, and shall be zinc-coated in accordance with the requirements of AASHTO MILI.
- Bottom tension wire shall just clear top of crown on concrete footings,
- For details and notes not shown see chain link fence Type I, sheet | of 3.
- 5. See sheet 3 of 3 for typical fence location.



DETAIL G BARBED WIRE SUPPORT ARM

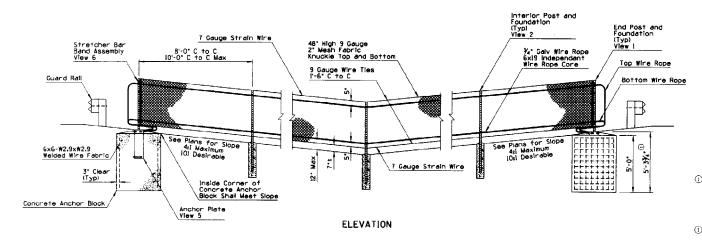
DESIGN APPROVED	STATE OF ARIZONA		MEV.
Teny H Otterner	DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	ON	3/94
APPROYED FOR	STANDARD DRAWINGS		
CHETRIBUTION -	FENCE, CHAIN LINK TYPE 2	DRAWING	NO.

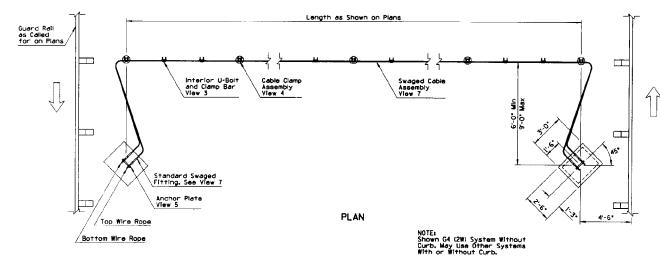


(Type 2, With Barbed Wire Typical)

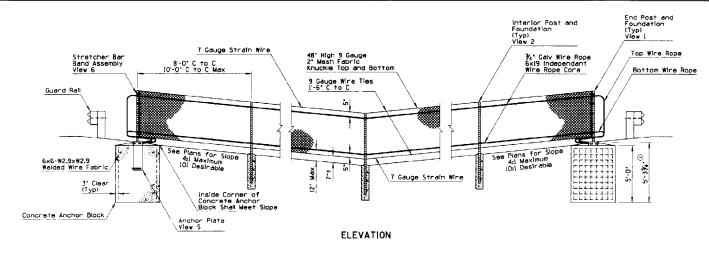
STANDARD DRAWINGS
FENCE, CHAIN LINK GATES

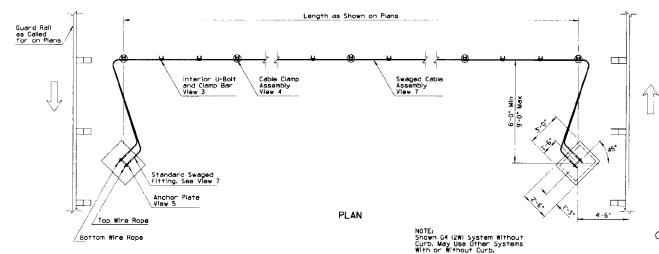
C-12.20 Sheet 3 of 3





- 1. All concrete shall be Class S. 4000 psi.
- All bolts, nuts, washers and fittings shall meet the dimensional requirements of the American National Standards Institute, unless otherwise designated and shall be galvanized in accordance with ASTM AL53.
- Gaivanized swaged fitting and U-Bolt shall conform to ASTM A449.
- The ¾' galvanized wire rope shall conform to AASHTO M30 Class B. Type 2.
- The wire fabric, ties, bands, stretcher bars, and other fittings and hardware shall conform to AASHTO MISI.
- The wire fabric fence shall follow contour of the graded median.
- The excavation for the concrete anchor blocks shall be to neat lines. Maximum excess shall be 3".
- 8. Perforated posts shall be square tube formed from 0.105' USS guage ASTM A 366/A 366M cold rolled carbon steel. The square tubes shall be welded directly in the corner by high frequency resistance welding or equal. The posts to be externally scarfed to agree with standard corner radii of 7½ 1 % 10.
- Perforated posts shall be galvanized to the requirements of ASTM A 653/A 653M. Coating Designator shall be Z275.
 - The cables shall have enough tension to prevent sagging. The location of the concrete anchor blocks may also be varied to provide enough tension to help prevent sagging.
 - Two interior U-boit and clamp bars shall be spaced at 1/3 of the distance between posts.
 - 12. See Standard C-12.20 for 48° fabric details.
 - An alternate to rectangular concrete anchor block shall be a 36° diameter round footing with an additional depth of 4°.
 - 14. The median approach grade within 100°± of the Chain Link Cable Barrier should not exceed a grade break of 10 percent.





- 1. All concrete shall be Class S, 4000 psl.
- All boits, nuts, washers and fittings shall meet the dimensional requirements of the American National Standards insittute, unless otherwise designated and shall be galvanized in accordance with ASIM AISJ.
- Galvanized swaged fitting and U-Bolt shall conform to ASTM A449.
- The ¾' galvanized wire rope shall conform to AASHTO M30 Class B, Type 2.
- The wire fabric, ties, bands, stretcher bars, and other fittings and hardware shall conform to AASHTO MiBi.
- The wire fabric fence shall follow contour of the graded median.
- The excavation for the concrete anchor blocks shall be to neat lines. Maximum excess shall be 3:.
- 8. Perforated posts shall be square tube formed from 0.105° USS guage ASTM A366 cold rolled carbon steel. The square tubes shall be welded directly in the corner by high frequency resistance welding or equal. The posts to be externally scarfed to agree with standard corner radii of \$y_1 \times 1/6."
- Perforated posts shall be galvanized to the requirements of ASIM A525. Coating Designator shall be 6-90.
- The cables shall have enough tension to prevent sagging. The location of the concrete anchor blocks may also be varied to provide enough tension to help prevent sagging.
- Two interior U-bolt and clamp bars shall be spaced at 1/3 of the distance between posts.
- 12. See Standard C-12.20 for 48° fabric details.
- 13. An alternate to rectangular concrete anchor block shall be a 36° diameter round footing with an additional depth of 4°.
- 14. The median approach grade within 100°± of the Chain Link Cable Barrier should not exceed a grade break of 10 percent.

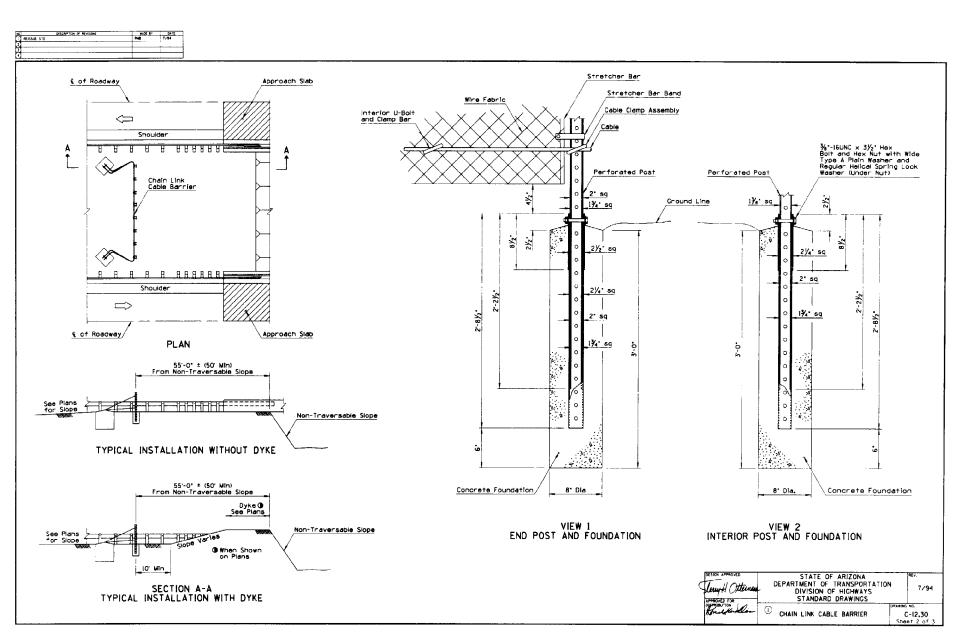
LUMPH OTHERS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

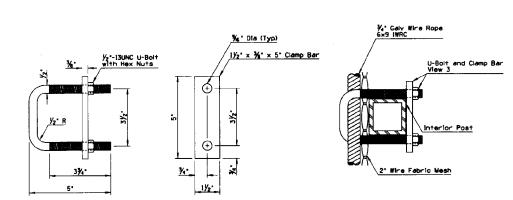
CHAIN LINK CABLE BARRIER

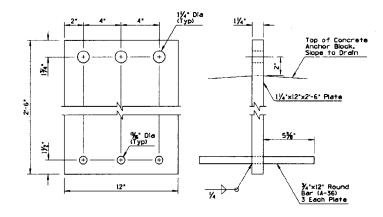
C-12.30 Sheet Lof 3

7/94





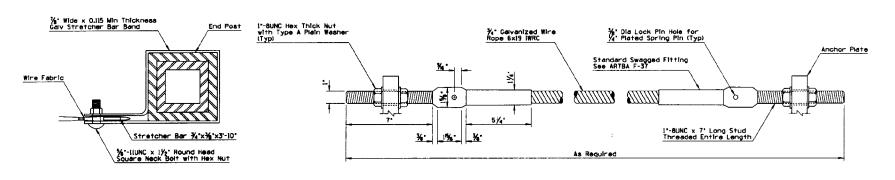




VIEW 3 U-BOLT AND CLAMP BAR

VIEW 4
CABLE CLAMP ASSEMBLY

VIEW 5 ANCHOR PLATE



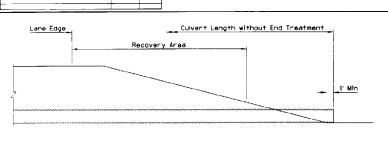
VIEW 6 STRETCHER BAR BAND ASSEMBLY

CHAIN LINK CABLE BARRIER

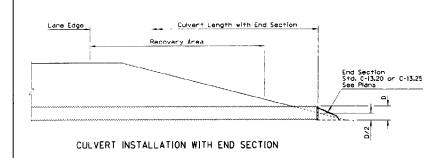
VIEW 7 SWAGED CABLE ASSEMBLY

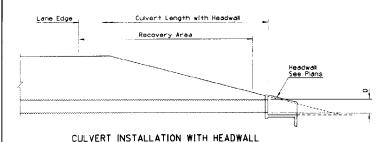
STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS 7/94 C-12.30

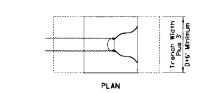
Sheet 3 of 3

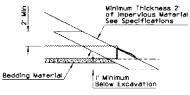


CULVERT INSTALLATION WITHOUT END TREATMENT









ELEVATION WITH END SECTION

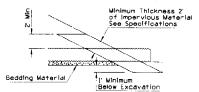
Dlameter (D) or Span (S) Outside

MINIMUM SPACIN	NG FOR MULTIPLE	INSTALLATIONS
	Installati	on Type
Diameter or Span	Projecting (W)	Headwall (E)
18*	12.	2-6-
24*	12"	3-0
30*	15*	3'-9"
36*	18-	4'-6"
42*	21*	5-3*
48' to 66'	(D or S)/2	D + 36*
72° and Over	36.	D + 36*

MULTIPLE INSTALLATIONS WITHOUT END SECTIONS

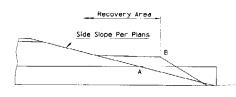
GENERAL NOTES

- See plans for any required inlet and/or outlet protection.
- See remaining C-I3 Series standards, Std B-II.II and Std B-II.I4.
- Dimensions W and E apply to both non-trench and trench conditions.
- 4. Minimum cover over pipe culverts shall be 12*, measured from the top of pipe.
 - See Pipe Berm Requirement Detail for pipe berm requirements and Std C-03,10 for installation.
 Point A is within the recovery area, then a pipe berm is required and Point B is set at the edge of the recovery area.
 - Plating of slopes at pipe locations similar for pipes without end sections and for multiple pipe installations.

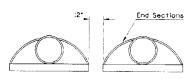


ELEVATION

PLATING SLOPES AT PIPE LOCATIONS

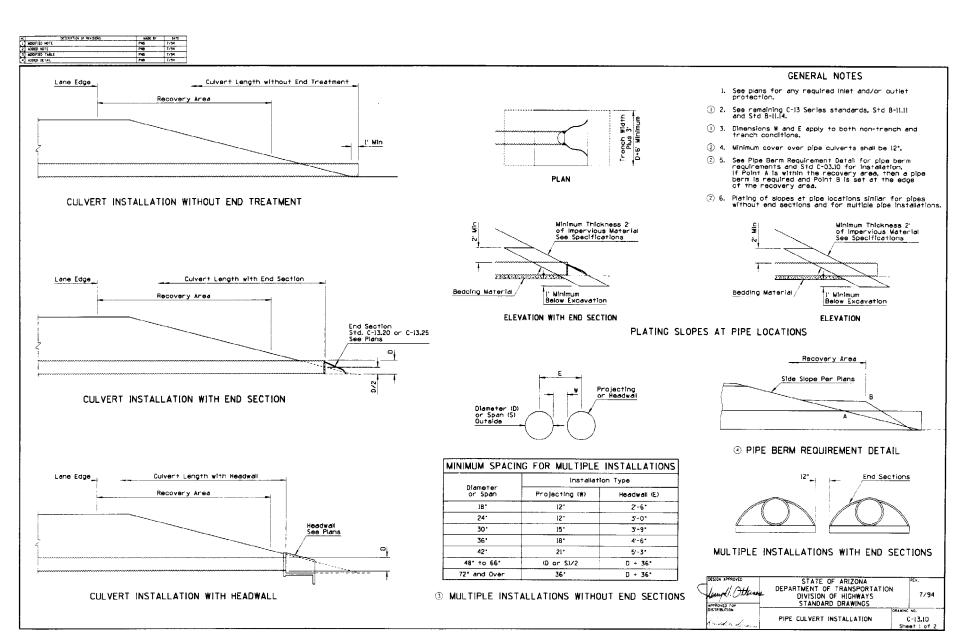


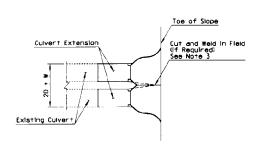
PIPE BERM REQUIREMENT DETAIL



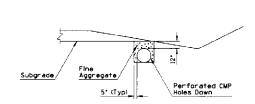
MULTIPLE INSTALLATIONS WITH END SECTIONS

	DESIGN APPROVED	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATE	ON	REV.
5	LEWY THUMBS	DIVISION OF HIGHWAYS STANDARD DRAWINGS	014	10/95
	mald askleam	PIPE CULVERT INSTALLATION		No. C-13,10 set 1 of 2

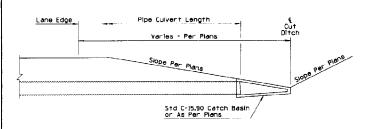




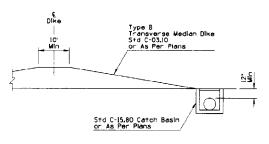
SPECIAL MULTIPLE PIPE END SECTION DETAIL FOR PIPE CULVERT EXTENSIONS ONLY



① PERFORATED CMP INSTALLATION



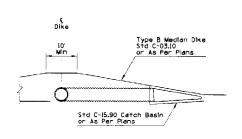
① PIPE AND CATCH BASIN INSTALLATION AT SAG CONDITION OF CUT DITCH



① PIPE AND CATCH BASIN INSTALLATION AT BASE OF TRANSVERSE DIKE

GENERAL NOTES

- 1. Minimum cover on pipe culver+s shall be 12° .
- See remaining C-I3 Series standards for other pipe details.
- 3 After welding, the damaged coating shall be cleaned by a wire brush and painted with at least one full coat of Paint No. 4, or given two coats of an approved hot asphalt paint, as directed by the Engineer.



© PIPE AND CATCH BASIN INSTALLATION AT FACE OF TRANSVERSE DIKE

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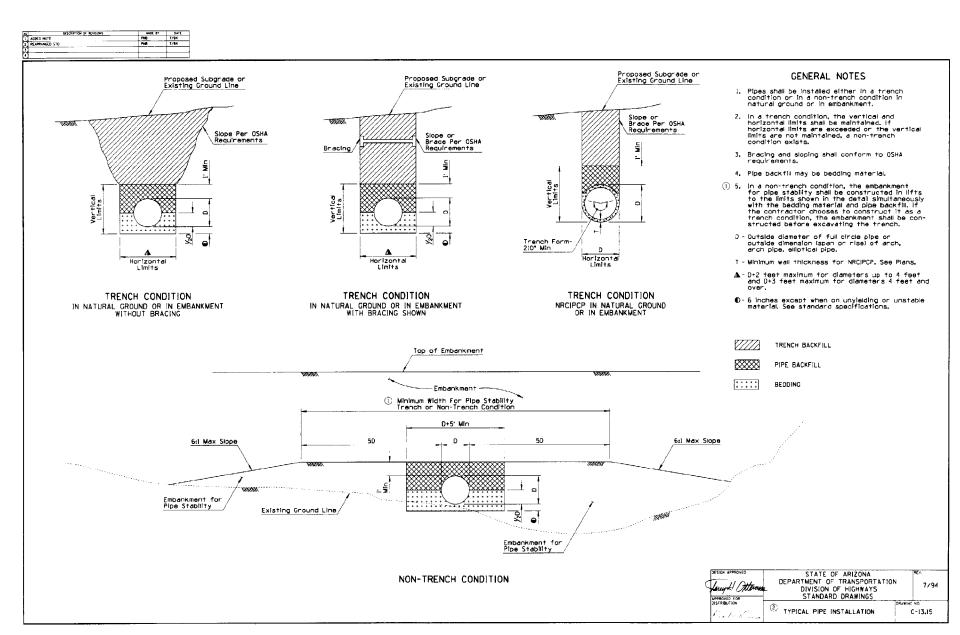
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
T/94

APPROVED

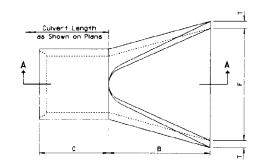
STANDARD DRAWINGS

OF ARICONO

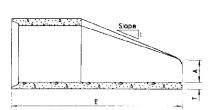
PIPE CULVERT INSTALLATION
Sheet 2 of 2





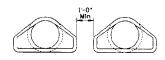


PLAN

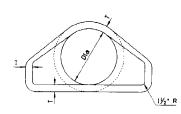


SECTION A-A

Dimensions - Inches Pipe Dia Approx Weight Approx Slope Т Ε 24' 9/2 43/2 30 1520* 731/2 48 3 27' 31/4 101/2 491/2 24 731/2 54 3 30' 2190* 31/2 12 54 193/4 73% 60 3 63 34¾ 97¾ 36' 4100* 15 72 3 5380* 41/2 21 63 35 98 3

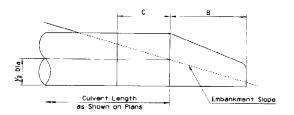


SPACING FOR MULTIPLE INSTALLATION

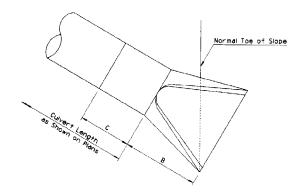


FRONT ELEVATION

- 1. Design of end section shall conform to standards.
- End section joint conformation shall match the pipe joints.
- Embankment slope shall be warped to match slope of end section.



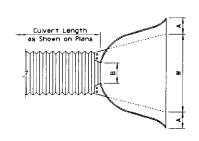
RIGHT ANGLE CULVERT

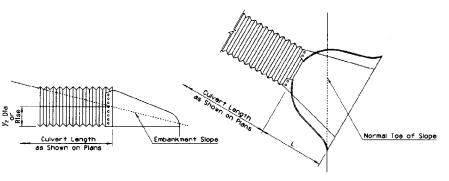


SKEWED CULVERT

	APPROVED FOR SISTABUTION	DIVISION OF HIGHWAYS STANDARD DRAWINGS	
		STANDARD DRAWINGS	
STATE OF ARIZONA REV.	Terry H. Otternes	OFFICE AS A SECOND OF THE SECO	7/94



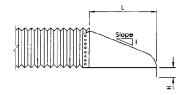


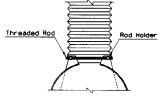


RIGHT ANGLE CULVERT

SKEWED CULVERT

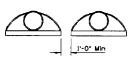
- The end section may be jointed to the pipe or connector section by boits, rivers, dimpled bands, slip-seam bands or threaded rod type fasteners, For allowable connector types, see table.
- The type I connector is by means of bolts or rivets. Maximum circumferential fastener spacing shall be 12 and with a minimum of 8 fasteners per joint. The type I joint may be used with either annular or helical corrugations.
- Type 2 and 3 connectors shall be used only with annular or helical pipe with a requisite number of annular corrugations.
- 4. Type 4 and 5 connectors shall be only used with helical pipe.
- 5. All steel end section components shall be galvanized.
- Toe of embankment shall be warped to match toe of skewed end section.
- A berm shall be added to abnormal projections per Std C-13,10.
- The foregoing applies to all cross section configurations.





TYPE 2

THREADED ROD CONNECTIONS



SPACING FOR MULTIPLE

INSTALLATION

Dimensions - Inches Pipe Dia Approx Slope Connection Type ₩ ±2 Ça ±1/2 181 16 8 6 31 36 2/2 1, 2, 3, 4, 5 241 16 10 13 6 41 48 21/2 1, 2, 3, 4, 5 30' 14 121/4 12/2 8 51 57 21/2 1, 2, 4, 5 14/2 36. 14 12 9 60 72 2/2 1, 2, 4, 5 42. 12 17 10/2 69 84 21/2

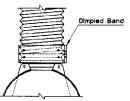
TYPE 1 RIVITED OR BOLTED CONNECTIONS

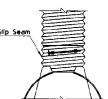
TYPE 3

THREADED ROD CONNECTIONS

Connector Lug

Threaded Rod





Dimpled Band	<u>Silp</u>

TYPE 4 DIMPLED BAND CONNECTIONS

TYPE 5 SLIP SEAM CONNECTIONS

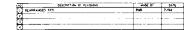
		ĺ	Dimer	nsion	s - II	;			
Pipe	Arch								
Span	Rise	Ga	A ±1	B Max	н ±]	±11/2	# ±2	Approx Slope	Connection Type
21-	15*	16	7 <i>Y</i> 2	11	6	24	36	2/2	1, 2, 3, 4, 5
28"	20.	16	8	16	6	32	48	21/2	1, 2, 3, 4, 5
35"	241	14	10	16	6	39	60	2/2	1, 2, 4, 5
42*	291	14	12	12	7 1/2	46	75	2/2	1, 2, 4, 5
49*	331	12	131/2	20	9	53	84	21/2	1

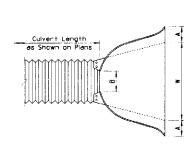
STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS

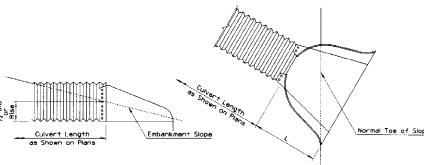
PIPE, CORRUGATED METAL END SECTION

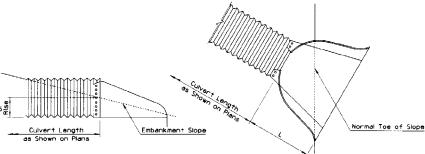
C-13.25

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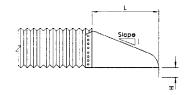


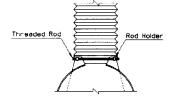






- The end section may be jointed to the pipe or connector section by bolts, rivets, dimpled bands, silp-seam bands or threaded rod type fasteners. For allowable connector types, see table.
- The type I connector is by means of bolts or rivets, Maximum circumferential fastener spacing shall be I2 and with a minimum of 8 fasteners per joint. The type I joint may be used with either annular or helical corrugations.
- Type 2 and 3 connectors shall be used only with annular or helical pipe with a requisite number of annular corrugations.
- Type 4 and 5 connectors shall be only used with helical pipe.
- 5. All steel end section components shall be galvanized.
- 6. Toe of embankement shall be warped to match toe of skewed end section.
- 7. A berm shall be added to abnormal projections per
- 8. The foregoing applies to all cross section configurations.

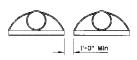




TYPE 2

THREADED ROD CONNECTIONS

RIGHT ANGLE CULVERT



SPACING FOR MULTIPLE

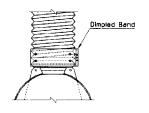
INSTALLATION

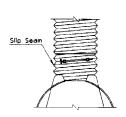
SKEWED CULVERT

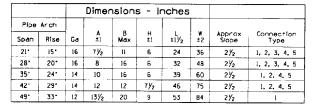
		Din	nensio	ns -	inche	s .		
Pipe Dia	Ga	A ±1	B Max	H ±1	±1 <i>y</i> ₂	₩ ±2	Approx Slope	Connection Type
18"	16	8	8	6	31	36	2 1/2	1, 2, 3, 4, 5
24*	16	10	13	6	41	48	21/2	1, 2, 3, 4, 5
30.	14	121/4	12 1/2	8	51	57	21/2	1, 2, 4, 5
36"	14	141/2	12	9	60	72	2 1/2	1, 2, 4, 5
42*	12	17	- 11	101/2	69	84	21/2	1

TYPE 1 RIVITED OR BOLTED CONNECTIONS

Connector Lug







TYPE 3 THREADED ROD CONNECTIONS

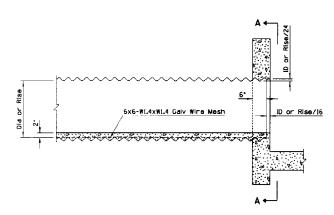
Threaded Rod

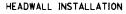
TYPE 4 DIMPLED BAND CONNECTIONS

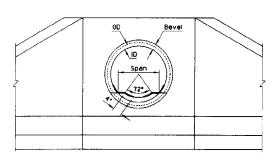
TYPE 5 SLIP SEAM CONNECTIONS

STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION 7/94 DIVISION OF HIGHWAYS STANDARD DRAWINGS PIPE, CORRUGATED METAL END SECTION C-13.25

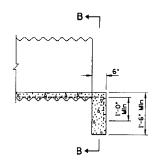
NO DESCRIPTION OF REVISIONS	MADE ST	DATE
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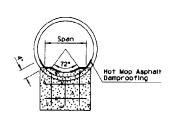




SECTION A-A

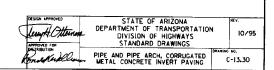


PROJECTING INSTALLATION

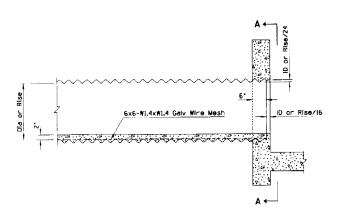


SECTION B-B

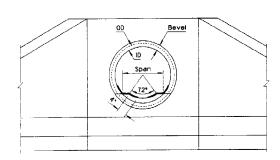
- For lateral dimensions of invert paving, use 72° control for CMP and span for CMPA.
- () 2. Paving shall be scored laterally at 1'-6' minimum intervals along the length of the pipe.
 - 3. Use bevel on inlet headwall only.
 - Wire mesh shall be fastened or welded to corrugation crests at intervals and in a manner approved by the Engineer, Laps shall be 6* minimum.
 - Paving shall not be placed until backfilling is completed.
 - 6. Concrete shall be Class B.
 - See Std C-14.20 for headwall and bevel dimensions not shown.



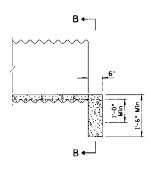




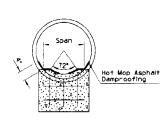
HEADWALL INSTALLATION



SECTION A-A



PROJECTING INSTALLATION



SECTION B-B

- For lateral dimensions of invert paving, use 72° control for CMP and span for CMPA.
- Paving shall be scored longitudinally at 1'-6" minimum lateral intervals.
- 3. Use bevel on inlet headwall only.
- Wire mesh shall be fastened or welded to corrugation crests at intervals and in a manner approved by the Engineer. Laps shall be 6° minimum.
- 5. Paving shall not be placed until backfilling is completed.
- 6. Concrete shall be Class B.
- 7. See Std C-14.20 for headwall and bevel dimensions not shown.

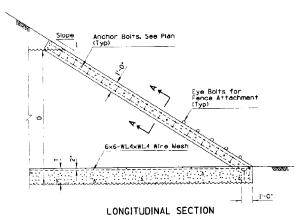
STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

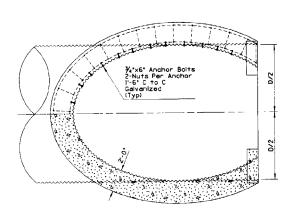
C-13.30

7/94

1 PIPE AND PIPE ARCH, CORRUGATED METAL CONCRETE INVERT PAVING

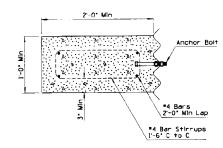
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I REARRANCED STD	PHE	7/94
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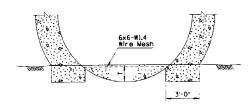


PLAN NORMAL TO SLOPE

	D	Т	S
Combination Vehicle and Cattle Pass	144*	1:-6"	Varies
Cattle Pass Only	120	6.	Varies



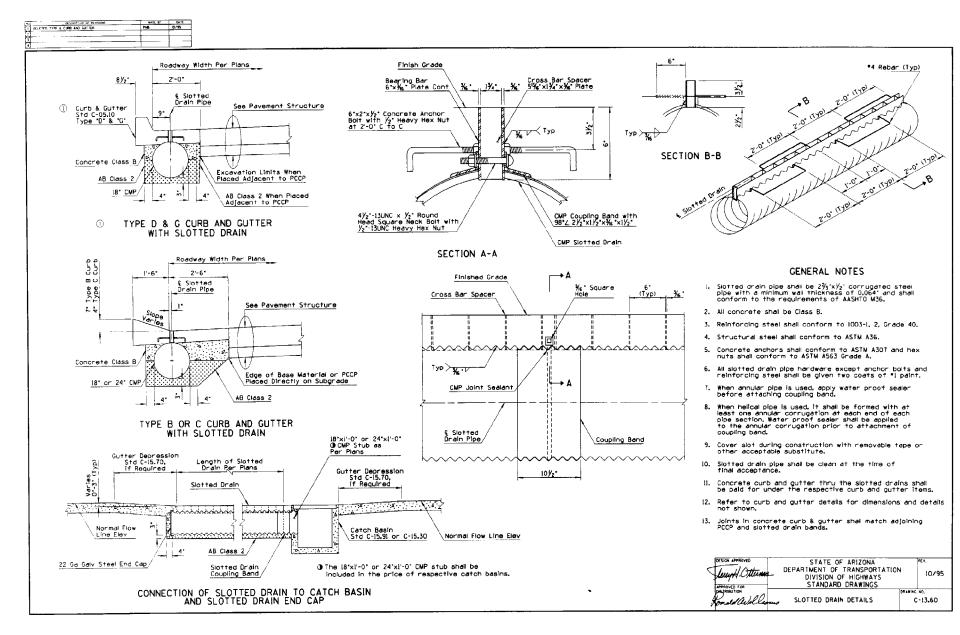
SECTION A-A

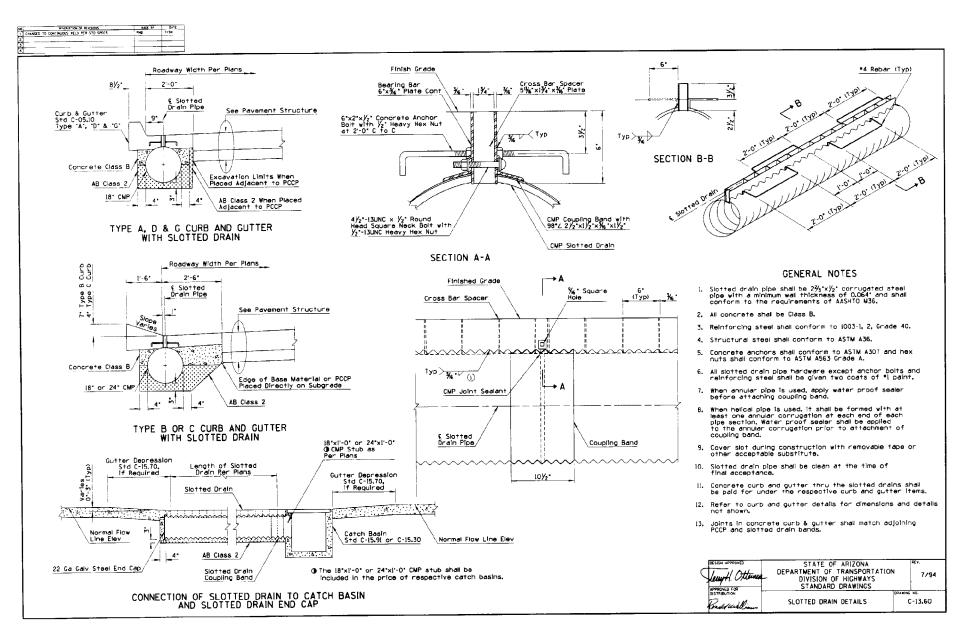


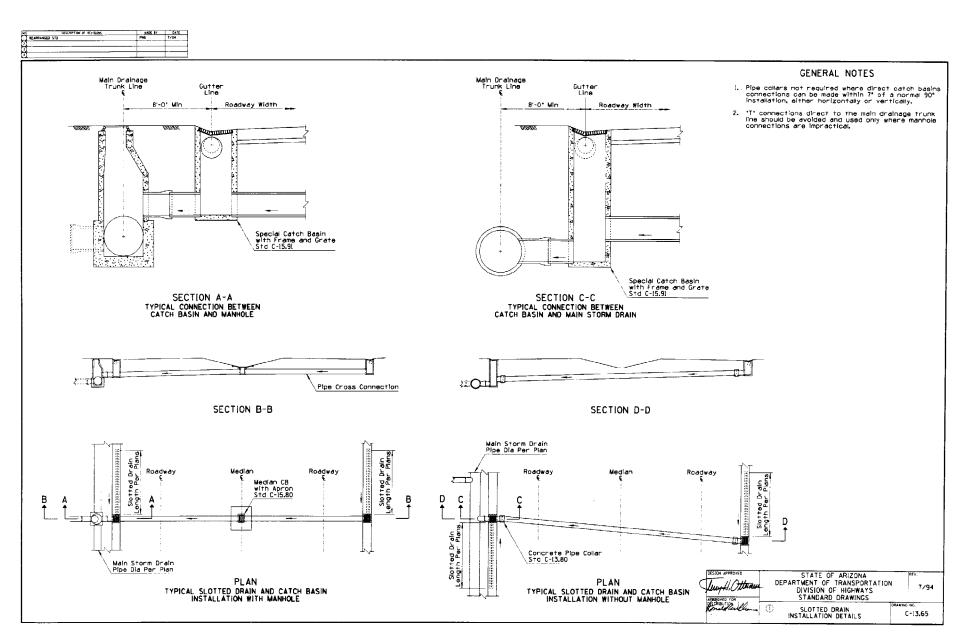
END ELEVATION

- This end treatment is to be used only for those cattle and/or vehicle passes not used for drainage.
- All concrete shall be Class B. An optional 12* AB invert paving base course and 6* of concrete may be used in the 144* diameter pipe.
- Anchor boits shall be retained in a horizontal position during pour with final tightening a minimum of 7 days after pour.
- Pipe shall be backfilled before concrete bond beam is constructed, Minimum forming may be used.
- Edges of wire mesh shall be fastened or welded to corrugation crests at intervals and in a manner approved by the Engineer. Laps shall be a minimum of 6.
- 6. For installation normal to roadway centerline only.

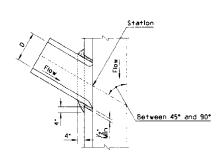




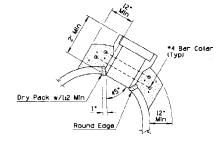




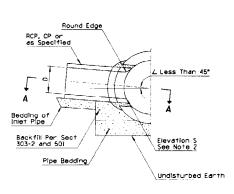
MO.	DESCRIPTION OF REVISIONS	MADE BY	DATE
I) REARRANGE	D STD	PMB	7/94
(2)			
33		1	
			



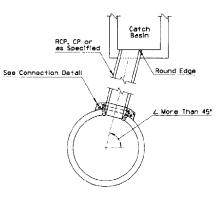
SECTION A-A



CONNECTION DETAIL TYPE 2



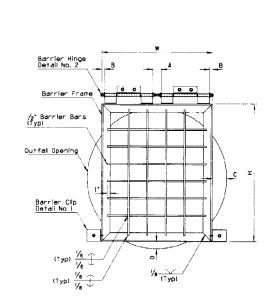
SIDE INLET TYPE I



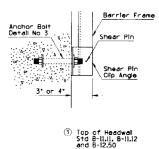
CATCH BASIN ABOVE STORM DRAIN TYPE 2

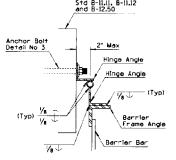
- Prefabricated tees shall be used when the outside diameter of the injet pipe exceeds one half of the inside diameter of the main storm drain, except when the manholes are shown on plans.
- Centerline of the inlet pipe shall intersect the centerline of the main storm drain except when elevation "S" is shown on plans.
- 3. If ∠ is 45° or less, type 1 shall be used.
- 4. All concrete shall be class B.
- All reinforcing steel shall conform to 1003-1, 2, grade 40.
- 6. Reinforcing steel shall have 2" minimum cover.





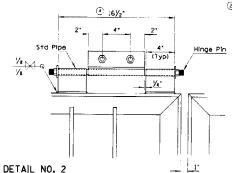
PIPE ACCESS BARRIER FRONT ELEVATION



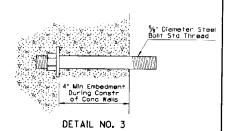


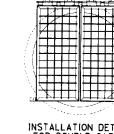
Shear Pin 4" or 5" Barrier Frame Shear Pin Clip Angle Anchor Bolt Detail No 3

DETAIL NO. 1



- All Shear pin angles shall fit snug and true to face. Cover with waterproof grease prior to installation of pin.
- 2. Shear pin holes in the angle shall be drilled for a tight fit of the pins.
- 3. Both ends of the shear pins shall be beened after installation. Shear pin material shall be commercially pure aluminum wire alloy 1100, Temper 0, Federal Spec. 00-4-411.
- 5. Galvanize all ferrous parts after fabrication.
- (2) Frame and hinge angles shall have the outstanding leas out.
 - 7. All steel shall be in accordance with ASTM A36.
- 2 3 8. Barrier bars shall be equally spaced.
- 3. Hinge pin material shall be bolt stock and threaded on both ends so nut and lock washer are flush with the lower angle. Cover pin with waterproof grease prior to installation. Upset or damage exposed threads after installation.





INSTALLATION DETAIL FOR DOUBLE GATES

Size of Outfall Pipe	No. of Barrier Gates	Frame Angles	Shear Pin Clip Angles	Shear Pins	Hinge Pins	Hinge Angles	Hinge Standard Pipe	No. & Length Of Vert. Bars	No. & Length Of Horz. Bars	H (Out to Out of Frame Angles)	W (Out to Out of Frame Angles)	A	В	С	D	Str. Steel
30.	1	2*x2*x¼*	4'×4'×/4'	2-1/8**	y _z -•	2 ×2 × 1/4	¥4°	4-31"	4-34*	33.	36*	3"	0"	-3*	2.	78.0
36,	1	2.×5.×¼.	4'x4'x 1/4'	2-1/8**	<i>y</i> ₂••	2.×5.×¼.	¥4·	4-31	4-34"	33*	36*	3.	0-	0-	3.51	78.0
42*	ì	2"x2"x1/4"	4'×4'×/4'	2-1/8**	1/2.€	2 ×2 × ¼	¥4.	4-41*	5-34*	43.	36.	3.	0.	3*	0.5	88.6
481	1	3.×3.×//	5'x3'x¼'	2-1/8**	₹4.0	2½"×2½"×¼"	1*	4-46*	6-34*	50*	38*	3.	1.	5*	1.	179.2
54	ı	3-×3.×1/6.	5'×3'×¼'	2-1/8**	₹4.0	2/2 ×2/2 ×/4	1.	5-52	7-40*	56'	44*	5*	3.	5-	2.	206.5
60"	1	3.×3.×1/6.	5'x3'x'/4'	2-1/8-0	¥4*•	2 /2 * × 2 /2 * × /4 *	1.	6-58	8-46"	62"	50*	9•	4.	5*	3.	235.6
66.	1	3.×3.×¼e.	5*x3*x¼*	2-1/8-0	₹4.0	2/2"×2/2"×1/4"	1*	7-64*	9-52	68.	56*	11.	6.	5*	4.	266.4
72*	2	3.×3.×¾	5"x3"x"/4"	2-1/8**	₹,••	2/2*×2/2*×1/4*	1.	4-69**	9-34**	73*	38*	3.	1-	-2.5	5.	443.6
78'	2	3'×3'×%	5'x3'x¼'	2-1/8*0	/. •	21/2 ×21/2 ×1/4	1.	4-75**	10-34**	79*	38-	3.	1-	0.5*	5.	468.4
84*	2	3.×3.×1/4.	5'×3'×¼"	2-1/8**	₹4.0	2/2 ×2/2 ×1/4	1*	4-81**	11-34**	85	38*	3*	1.	3.5*	5.	493.2
90*	2	3.×3.×1/4	5'x3'x¼'	2-1/8**	3/4.0	21/2 ×21/2 ×1/4	1*	4-87**	12-36**	91.	40*	3.	2,	4.5"	5*	527.0
96*	2	3'×3'×1/6'	5'x3'x¼'	2-1/8**	3/4.0	21/2 ×21/2 ×1/4	1*	5-93**	13-39**	97*	43*	4.	3.	4.51	5.	579.0

• Per Gate

APPROVED FOR

STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS

STORM DRAIN OUTLET DETAILS

DRAWING NO. C-13.75 Sheet 1 of 2

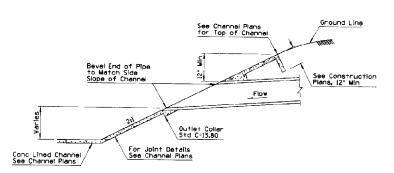
7/94



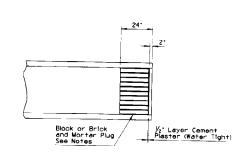
- Compact soil at end of pipe plug to 95% of maximum density.
- If depth of cover is less than 5' or greater than 10', increase plug thickness a minimum of 4'.

① ①

①



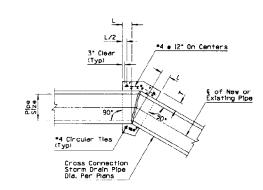
DRAINAGE OUTLET INTO CHANNEL



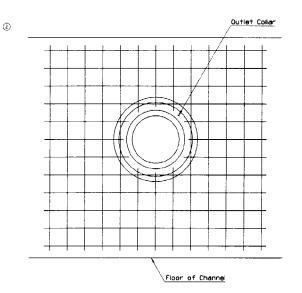
STORM DRAIN PLUG

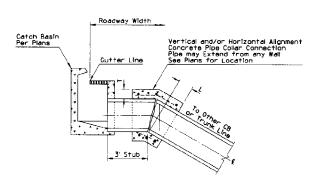
②

HIP.	DESCRIPTION OF REVISIONS	MADE EY	DATE
I) REVISED D	MENSION	PMB	7/94
2) ADDED DET	AH.	PNB	7/94
3) HEAPRANGE	0 STD	PNB	7/94

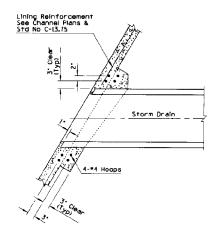


CONCRETE PIPE COLLAR





TYPICAL LATERAL CONNECTIONS TO CATCH BASINS WITH CONCRETE COLLARS

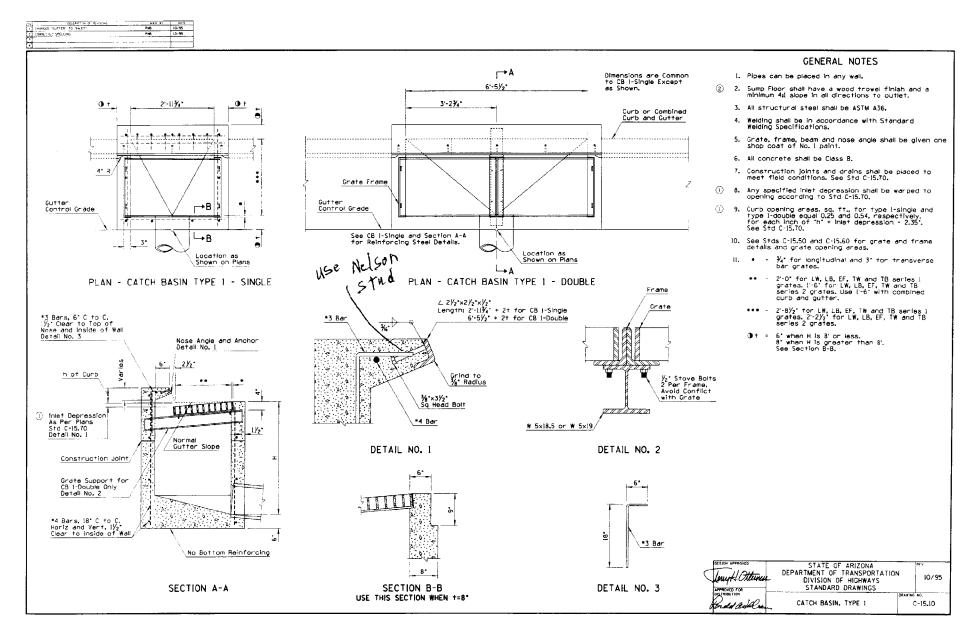


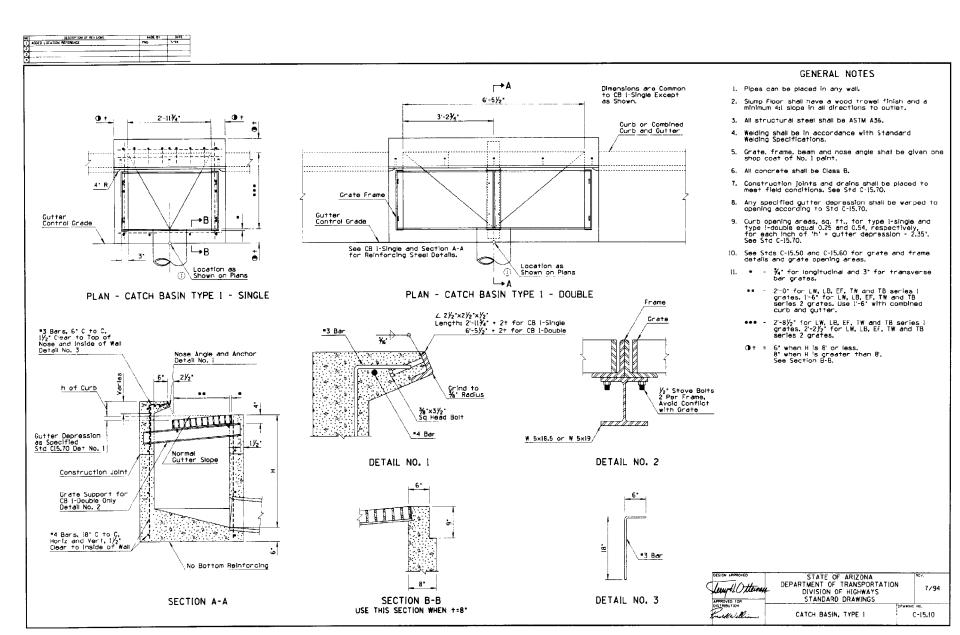
OUTLET COLLAR DETAIL

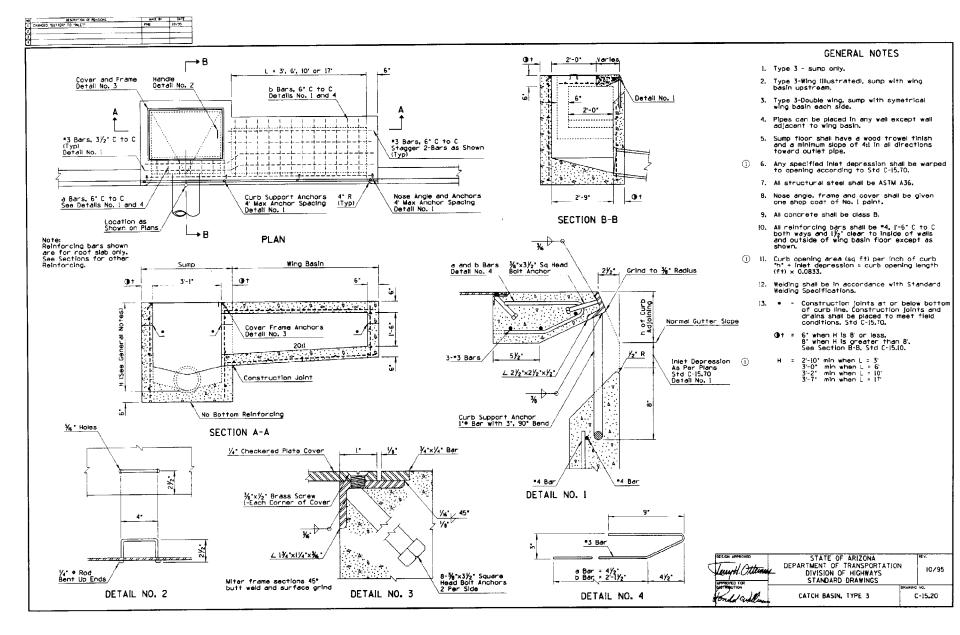
- I. All Concrete shall be Class B.
- 2. All reinforcing steel shall conform to 1003-1, 2, Grade 40.
- ① 3. All reinforcing steel shall have 3° minimum clear cover.
 - A concrete collar shall be required where pipes of different diameters or materials are joined or where the design change in diagrament or grade exceeds that allowed for a standard joint,
 - When pipes of different diameters are joined with a concrete collar, "!" & "I" shall be those of the larger diameter.
 - The diameter of the circular ties shall be the outside diameter of pipe + T.
 - Pipe ends to be trimmed such that the maximum distance between pipes at any point is 2".

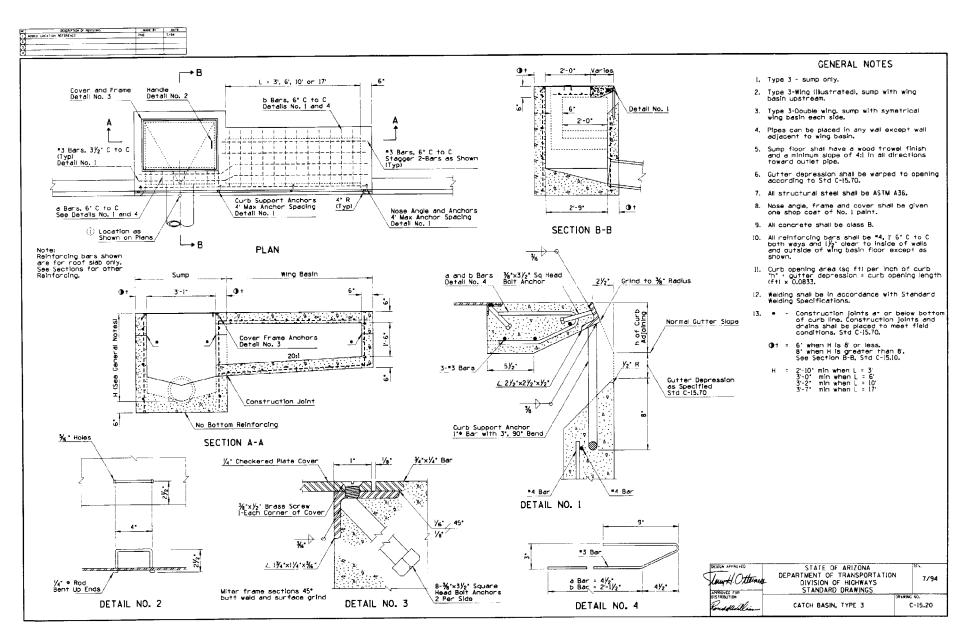
PIPE	COLL	AR TABI	_E
Pipe Size	L	T	*4 Ties
12*	1.00	4.	3
18"	1.00	5'	3
24*	1.00	6.	3
30*	1.50'	8,	3
36*	1.50	8.	3
42*	1.75	10-	4
48*	1.75	10*	4
52'	1.75	10.	4
60"	1.75	11.	4
66.	2.00	11*	5
72*	2.00	14.	5
78*	2.00	14	5
84*	2.25'	16.	5
96.	2.25'	16.	5

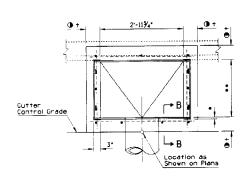
LULY H. OTTUNES	STANDARD DRAWINGS	1/94
Condition Conditions	3 PIPE COLLAR DETAILS	C 13,80



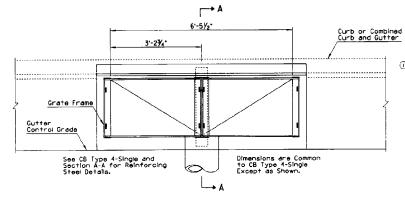




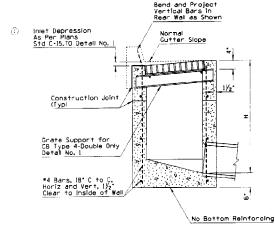




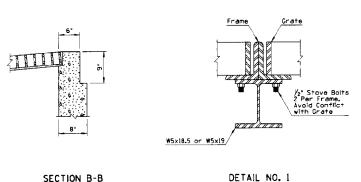
PLAN - CATCH BASIN TYPE 4 - SINGLE



PLAN - CATCH BASIN TYPE 4 - DOUBLE



SECTION A-A

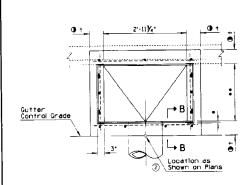


USE THIS SECTION WHEN +=8"

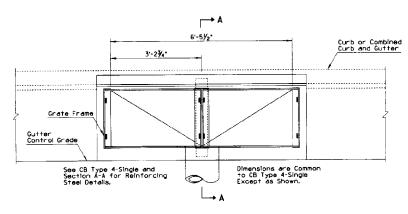
GENERAL NOTES

- i. Pipes can be placed in any wall.
- Sump floor shall have a wood trowel finish and a minimum 4:1 slope in all directions toward outlet pipe.
- Curb over catch basin shall not be constructed untill catch basin concrete has set for a minimum of 24 hours.
- See Stds C-15.50 and C-15.60 for grate and frame details and opening areas.
- 5. Any specified inlet depression shall be warped to opening according to Std C-15.70.
 - 6. All structural steel shall be ASTM A36.
 - Grate, frame and beam shall be given one shop coat of No. 1 paint.
 - 8. All concrete shall be Class B.
 - Construction joints and drains shall be placed to meet field conditions. Std C-15.70.
 - 10. - $\frac{y_4}{4}$ for longitudinal and 3° for transverse bar grates.
 - 2'-0" for LW, LB, EF, TW and TB series 1 grates. 1'-6' for LW, LB, EF, TW and TB series 2 grates, Use 1'-6' with combined curb and gutter.
 - ①f = 6* when H is 8' or less, 8* when H is greater than 8', See Section B-B.

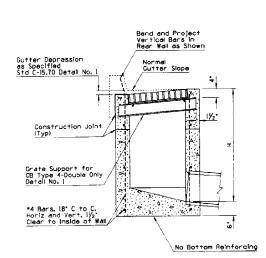




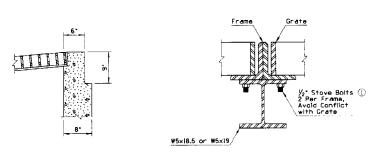
PLAN - CATCH BASIN TYPE 4 - SINGLE



PLAN - CATCH BASIN TYPE 4 - DOUBLE



SECTION A-A

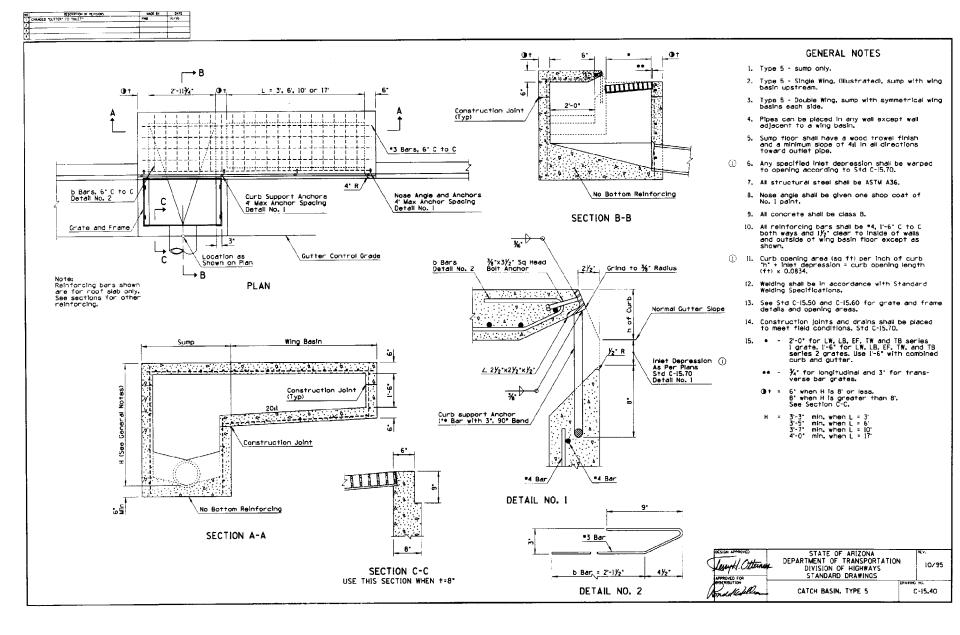


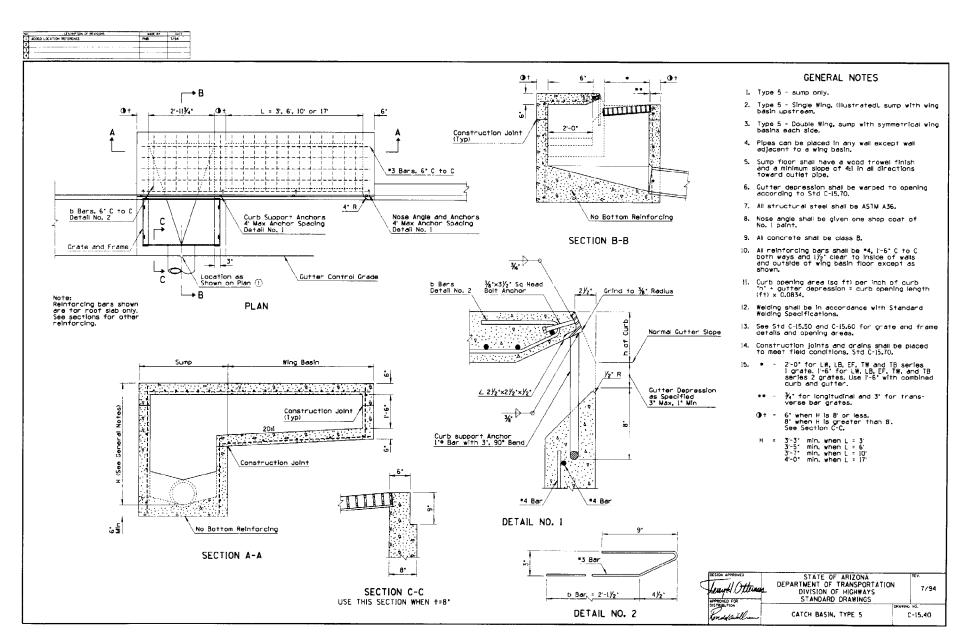
SECTION B-B
USE THIS SECTION WHEN +=8"

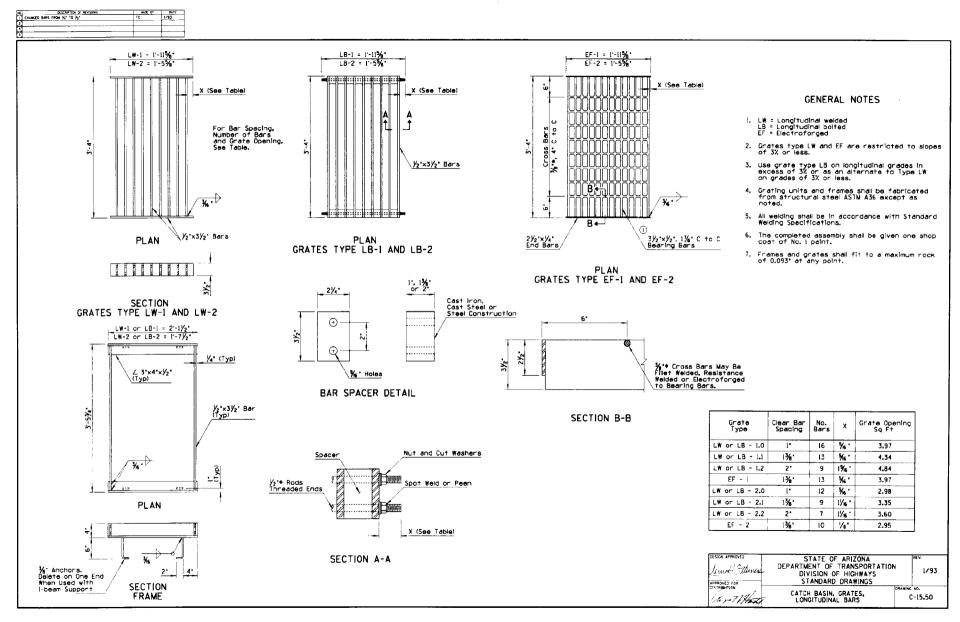
DETAIL NO. 1

- 1. Pipes can be placed in any wall.
- Sump floor shall have a wood trowel finish and a minimum 4:1 slope in all directions toward outlet pipe.
- Curb over catch basin shall not be constructed untill catch basin concrete has set for a minimum of 24 hours
 See Stds C-15.50 and C-15.60 for grate and frame details
- and opening areas.
- Any specified gutter depression shall be warped to opening according to Std C-15.70.
- 6. All structural steel shall be ASTM A36.
- Grate, frame and beam shall be given one shop coat of No. 1 paint.
- 8. All concrete shall be Class B.
- Construction joints and drains shall be placed to meet field conditions. Std C-15.70.
- 0. - $\frac{y_4}{4}$ for longitudinal and 3° for transverse bar grates.
 - - 2'-0' for LW, LB, EF, TW and TB series I grates. I'-6' for LW, LB, EF, TW and TB series 2 grates. Use I'-6' with combined curb and gutter.
 - () t = 6' when H is B' or less. B' when H is greater than B'. See Section B-B.

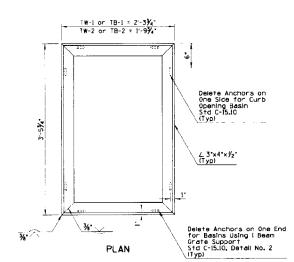


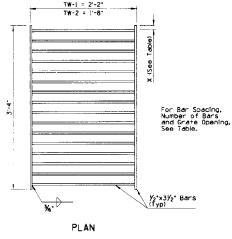


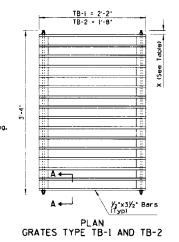




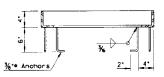








- LW = Longitudinal welded LB = Longitudinal bolted EF = Electroforged
- 2. Restrict use to grades of 3% or less.
- Grating units and frames shall be fabricated from structural steel ASTM A36 except as noted.
- All welding shall be in accordance with Standard Welding Specifications.
- 5. The completed assembly shall be given one shop coat of No. I paint.
- Frames and grates shall fit to a maximum rock of 0.093" at any point.
- 7. For Type EF grates, see Std C-15.50.



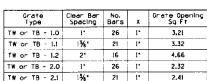




GRATES TYPE TW-1 AND TW-2

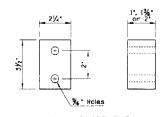


2,65

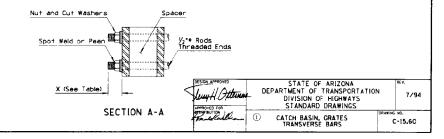


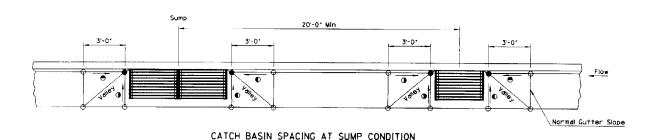
16 1*

T₩ or TB - 2.2



BAR SPACER DETAIL CAST IRON, CAST STEEL OR STEEL BAR STOCK

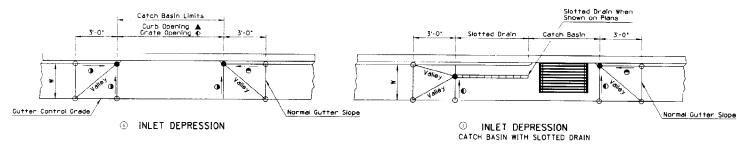


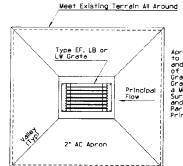


- I. No inlet depression shall extend into a traffic lane.
- 2. Maximum combined inlet and gutter depression is 3 inches. See Detail No. 1.
- Maximum distance along curb between catch basins where full gutter depression is used is 10 feet.
- 4. See Std. C-15.80 for aprons used with C-15.80 Catch Basin.

LEGEND

- O Normal pavement or gutter flow line elevation.
- Depressed elevation.
- 👱 Straight grade with downward siope.
- W Normal gutter width per Std. C-05.10.
- ▲ Types I, 3, & 5.
- ◆ Type 4 & C-15.91.





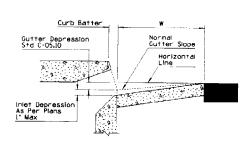
CATCH BASIN TYPE 4
OFF ROADWAY LOCATION

Apron Shall Be Shaped to Sult Local Conditions and Shall Extend a Min of 4-0 from Edge of Crate in All Directions, Crate Shall Be Depressed a Minimum of 4* Below Surrounding Terrain and Bearing Bars Shall Parallel Direction of Principal Fow.

Plug with Conc
Upon Pavement
Completion
Siope to Drain

Catch Basin Wall

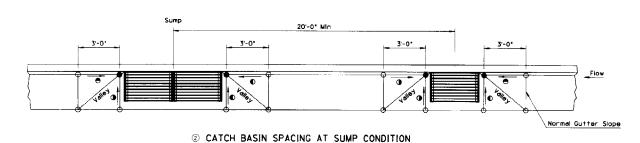
CATCH BASIN CONSTRUCTION DRAIN DRAIN MAY BE DELETED AT OPTION OF ENGINEER



DETAIL NO. 1

LLWH. Ottings.	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	10/95
forsed William	CATCH BASIN MISC. DETAILS	C-15.70

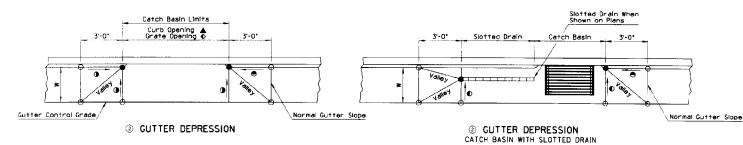




- No gutter depression shall extend into a traffic lane.
- ① 2. Maximum gutter depression is 3 inches. See Detail No. 1.
- Maximum distance along curb between catch basins where full gutter depression is used is 10 feet.
 See Std. C-15.80 for aprons used with C-15.80 Catch Basin.

LEGEND

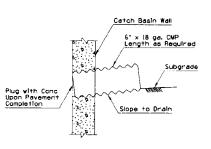
- O Normal pavement or gutter flow line elevation.
- Depressed elevation.
- 9 Straight grade with downward slope.
- W Normal gutter width per Std. 8-05.10.
- ▲ Types 1, 3, & 5.
- ◆ Type 4 & C-15.91.



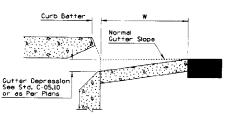
Type EF, LB or LW Grate

Apron Shall Be Shaped to Suit Local Conditions and Shall Extend a Min of 4-0' from Edge of Grate in All Directions. Grate shall be Depressed a Minimum of 4' Below Surrounding Terrain and Bearing Bars Shall Parallel Direction of Principal Flow.

CATCH BASIN TYPE 4
OFF ROADWAY LOCATION



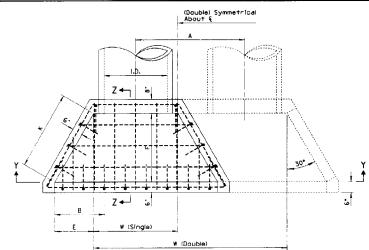
CATCH BASIN CONSTRUCTION DRAIN
DRAIN MAY BE DELETED AT OPTION OF ENGINEER

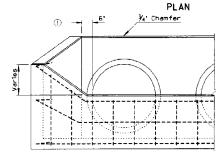


DETAIL NO. 1

APPROVED FOR DISTRIBUTION	STANDARD DRAWINGS CATCH BASIN MISC. DETAILS	DRAWING	NO. C-15.70
leingth Other in		ION	7/94
DESIGN APPROVED	STATE OF ARIZONA		REV.







3'-6"

4'-4"

5'-2"

6'-0"

1'-7/2'

2'-0"

2'-4/z"

2'-9"

1'-1/2

1'-6'

1'-10/2"

2'-3"

1'-113/6"

2'-7/4"

3'-3"

3'-103/4"

3'-5"

3'-9"

4'-0"

4'-4"

11-

1'-1"

1'-6"

PIPE

I.D.

18"

30-

36"

Single

2'-6'

3'-0"

3'-6"

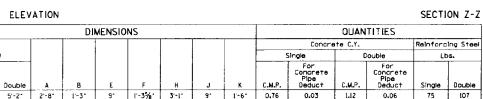
4'-0"

4'-6"

7'-10"

9'-2"

10'-6"



2'-3"

3 -0

3'-9"

4'-6"

1.00

1.50

1.96

2.49

0.04

0.06

0.09

0.11

1.55

2.29

3.01

3.85

0.09

0.13

0.17

0.23

92

112

145

189

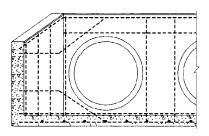
136

166

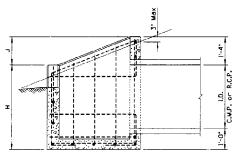
214

279

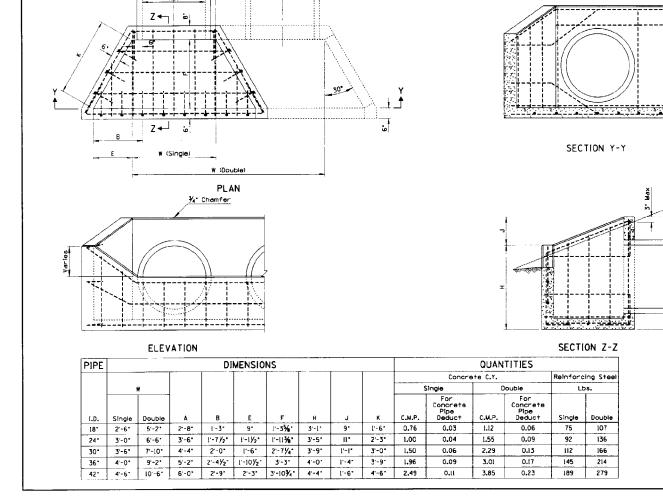
- 1. See also Std. C-13.10.
- High point of headwall shall not project more than 3" above slope.
- 3. All concrete shall be Class B.
- All reinforcing bars shall be Number 4, 1'-0' C to C and 3' clear to inside of walls and floor.



SECTION Y-Y



DESIGN APPROVED LUMY H. Ottlings	STANDARD DRAWINGS	10/95
Considerables		C-15.75

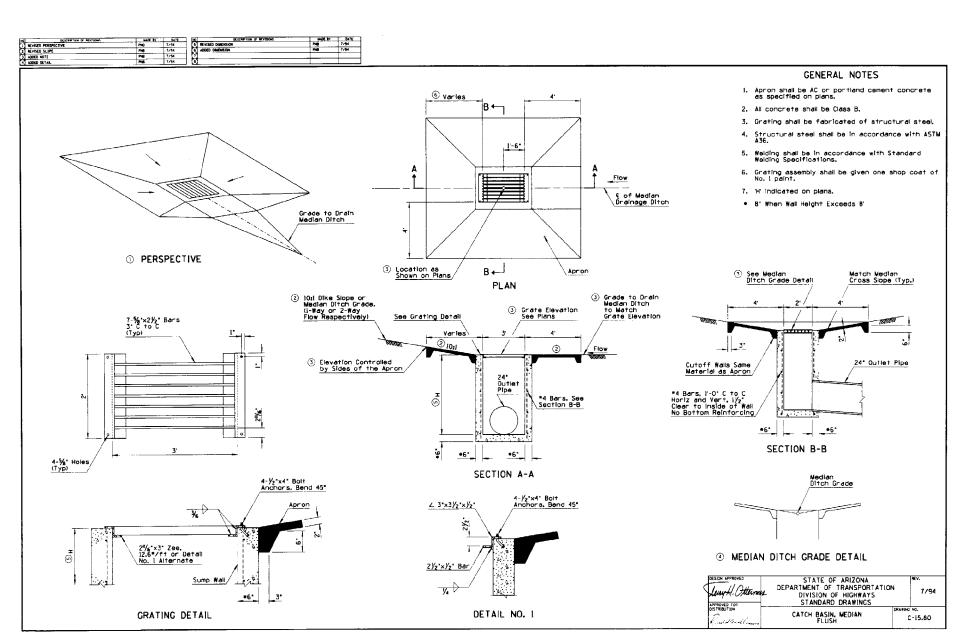


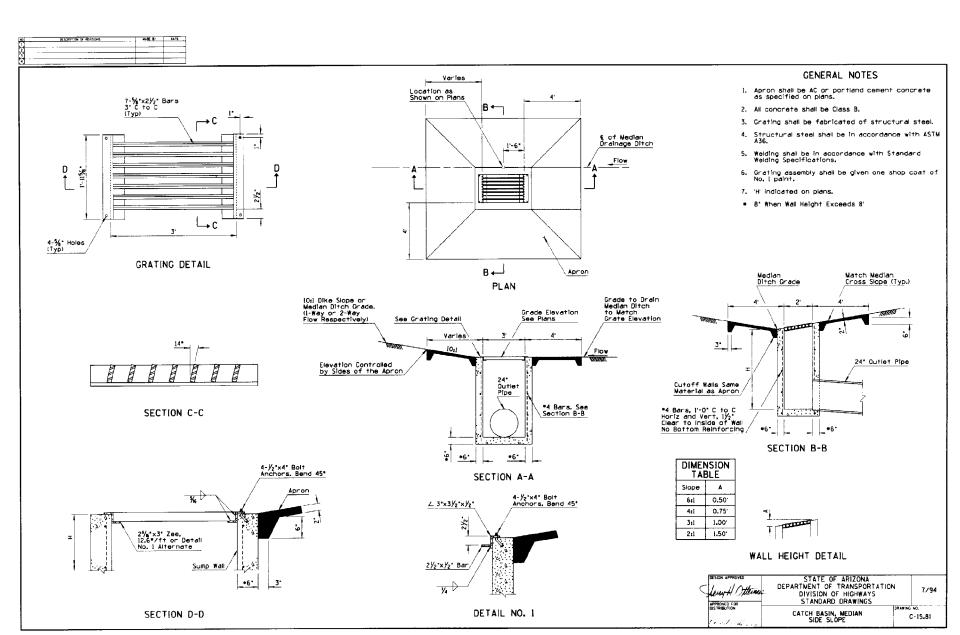
(Double) Symmetrical About §

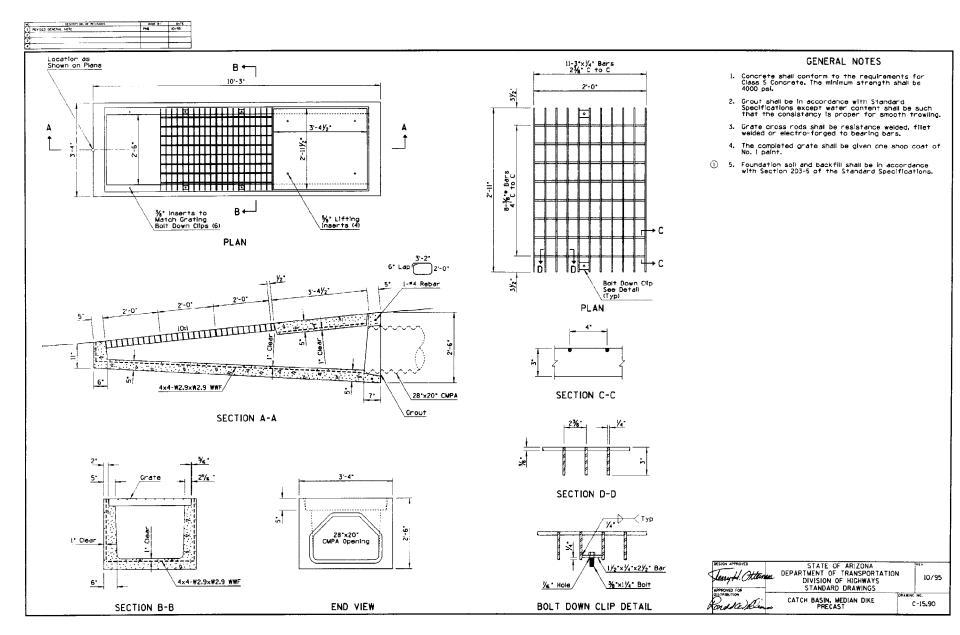
DESCRIPTION OF REVISIONS
THORNWOLD C-14.30, & REARRANGED

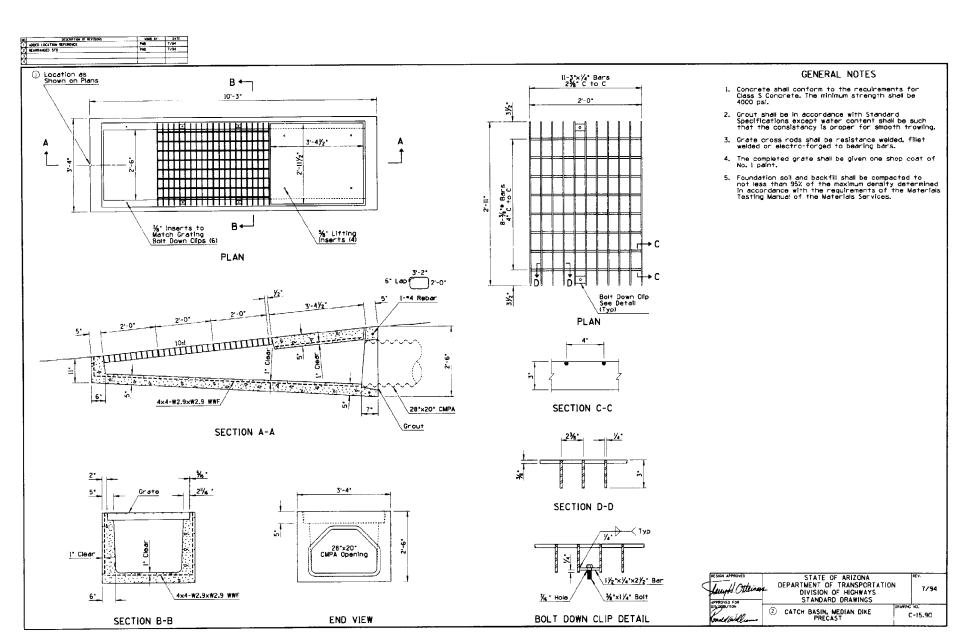
- 1. See also Std. C-13.10.
- High point of headwall shall not project more than 3° above slope.
- 3. All concrete shall be Class B.
- All reinforcing bars shall be Number 4, I'-0" C to C and 3" clear to inside of walls and floor.

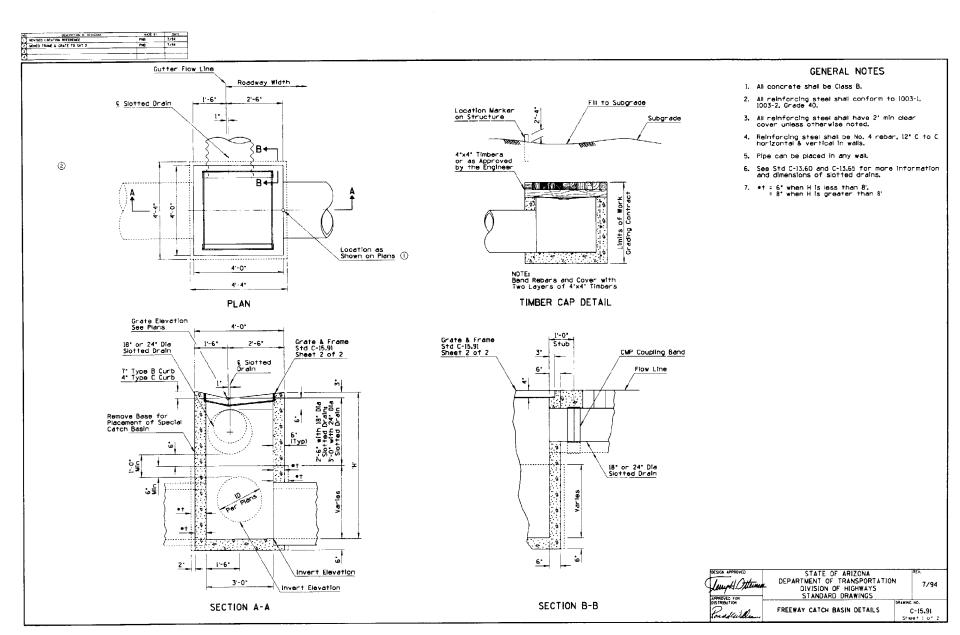
Terry 4. Otterna	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		7/94
APPROVED FOR CASTRIBUTION		DRAWING	WO.
marghille	CATCH BASIN, DROP INLET	1	-15.75

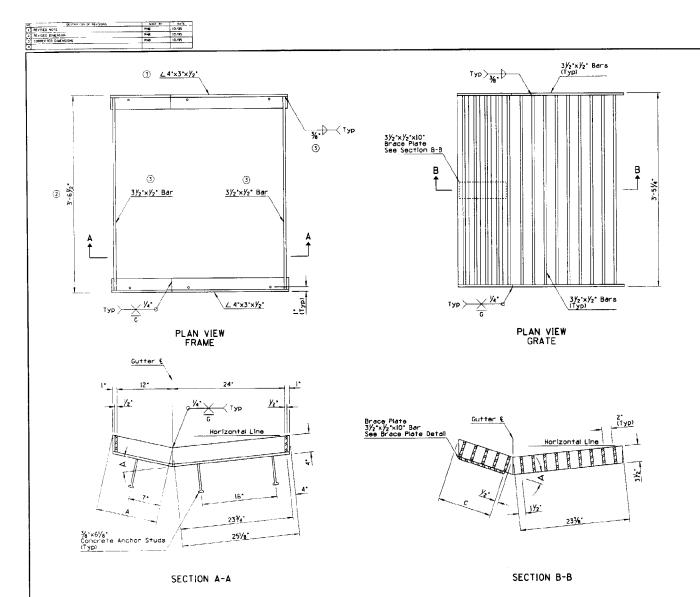






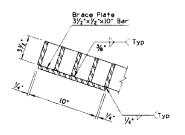






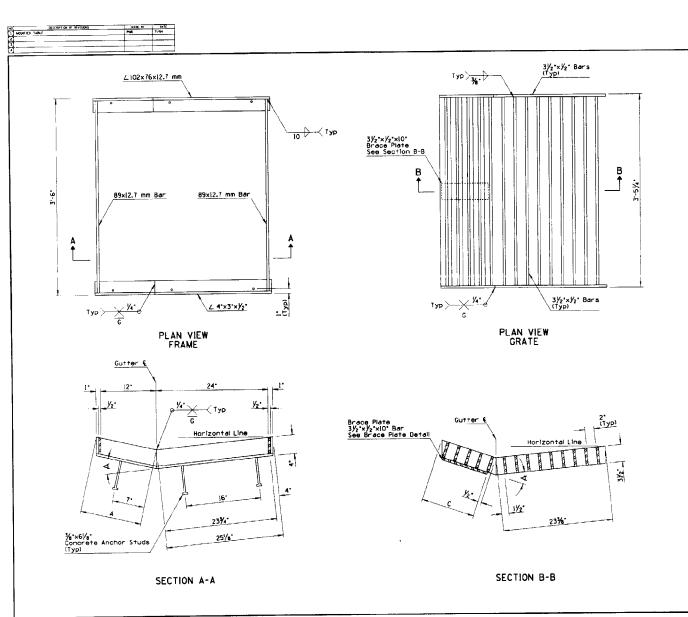
- All structural steel shall be in accordance with ASTM Spec's A-36.
- Crate design is not suitable for locations subject to bicycle traffic.
- 3. All welding shall be in accordance with Standard Welding Specifications.
 - The completed grate assembly (frame & grate) shall be given two shop coats of No. 1 paint.
 - The installation and inspection of steel studs welded to steel acting as connection devices to the concrete shall conform to the American Welding Society's Structural Welding Code (AWS DI.I), Specifications 4.21-4.27.

GRATE AND FRAME DIMENSIONS						
	Catch Basin Frame Catch Basin Gr					Basin Grate
Type	Heigth	Gutter Width	Α	∢	С	∢
В	6.	2'-6"	131%	26*-57'-40*	121/16"	26"-57'-40"
С	3.	2'-6"	131/6"	18"-14'-22"	111/8	18*-14'-22*



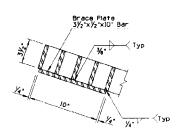
BRACE PLATE DETAIL

Lewy H. Otterney	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	10/ 9 5
toned leid ain	FREEWAY CATCH BASIN DETAILS	но. C-1 5.9 1 et 2 of 2



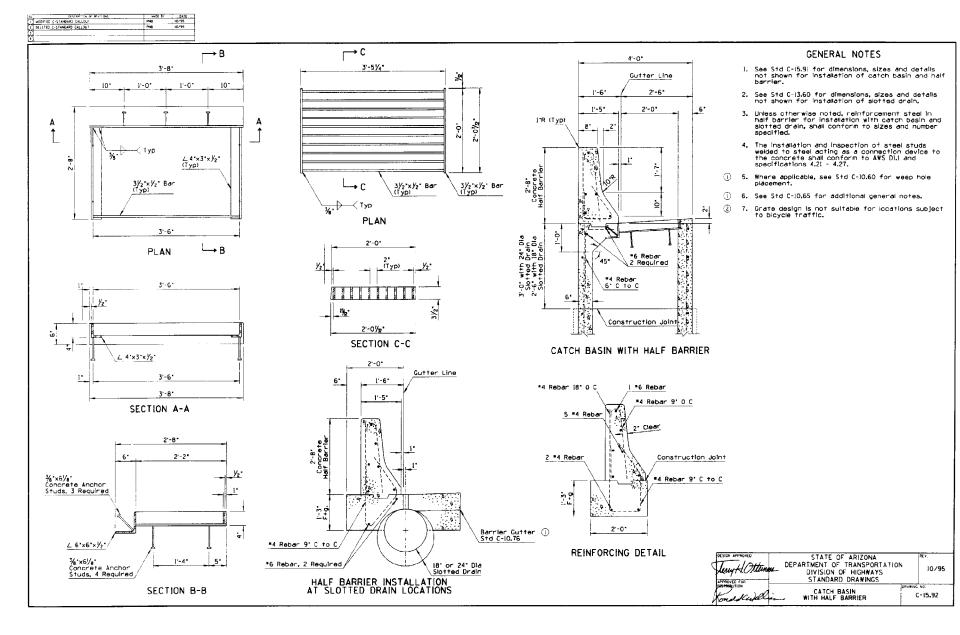
- All structural steel shall be in accordance with ASTM Spec's A-36.
- All reinforcement steel shall conform to 1003-1, 1003-2, Grade 40.
- All welding shall be in accordance with ADOT specifications.
- 4. The completed grate assembly (frame & grate) shall be given two shop coats of No. 1 paint.
- The installation and inspection of steel studs welded to steel acting as connection devices to the concrete shall conform to the American Welding Society's Structural Welding Code (AWS D.I.), Specifications 4.21-4.27.

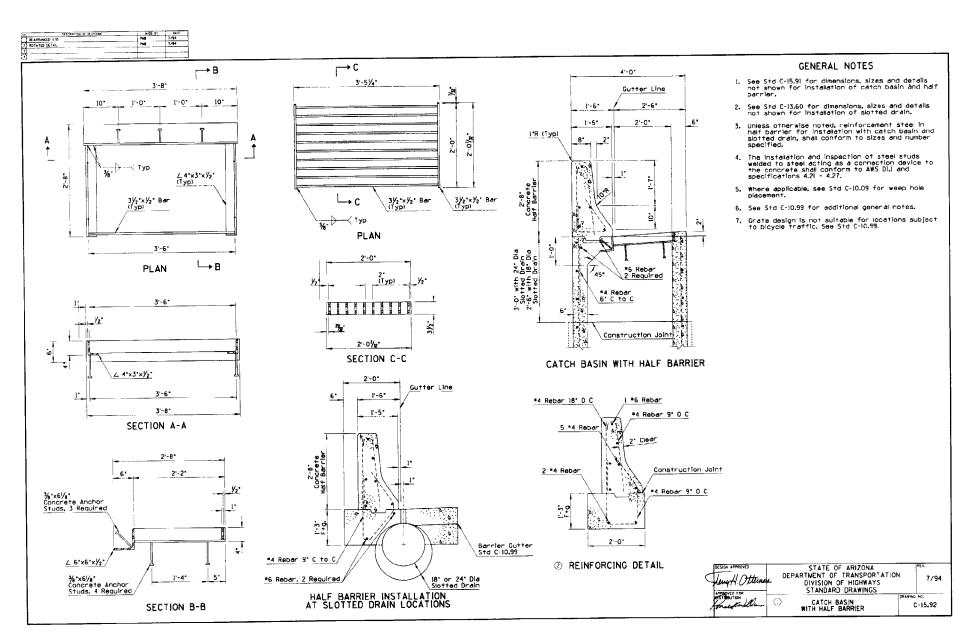
① GRATE AND FRAME DIMENSIONS						
Catch Basin Frame Catch Basi					Basin Grate	
Type	Heigth	Gutter Width	A	∢	С	4
В	6.	2'-6"	131%	26*-57'-40*	121/16*	26"-57'-40"
С	3'	2'-6"	13%	18*-14*-22*	111/8.	18°-14'-22*

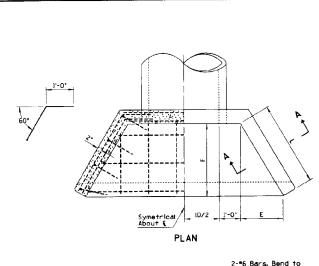


BRACE PLATE DETAIL

Lewy H. Otternes	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATIO DIVISION OF HIGHWAYS STANDARD DRAWINGS	1/94
Konst Carlleans	FREEWAY CATCH BASIN DETAILS	C-15.91 Sheet 2 of 2

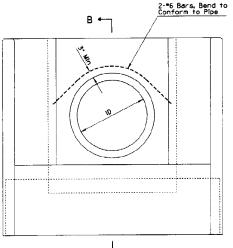




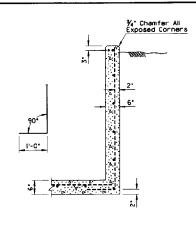


HO DESCRIPTION OF REVISIONS

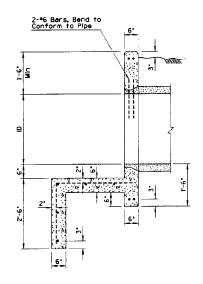
1) CHANGED 'DIVISIONS' 10 'SECTIONS'



ELEVATION



SECTION A-A

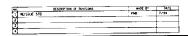


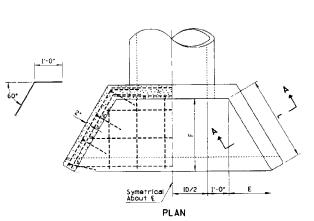
SECTION B-B

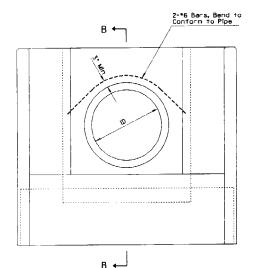
- I. All concrete shall be Class B.
- All reinforcing bars shall be "4 except two "6 bars over pipe. Bar spacing approximately 1'-0" center to center unless otherwise noted.
- 3. 30° wing wall flare shown; 45° normally desirable. See Hydraulics and Utility and Railroad Engineering Sections.

PIPE	DIMENSIONS			(CNAUC	TITIES
			_	CY Cor	orete	
1D	L	E	(Approx)	СМР	RCP	Reinf Steel Lbs
18"	2'-0"	1,-0.	1'-9"	0.97	0.96	65
24"	50.	10.	1'-9"	1.11	1.07	78
30-	3'-0"	16.	2'-7"	1.50	1.44	108
36'	4'-0"	2'-0"	3,-6,	2.08	2.01	150
42*	5'-0"	2'-6"	4'-4"	2.71	2.63	205
48"	60.	3'-0"	5'-2"	3.39	3.30	270
54"	7'-0"	3'-6"	6'-1"	4.14	4.02	335
60-	8'-0"	4'-0"	6'-11"	4.96	4.80	410

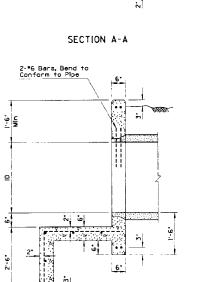
LELLY H. OLLUMIA	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	10/95
fond flisher		C-16_10







ELEVATION



¾° Chamfer All Exposed Corners

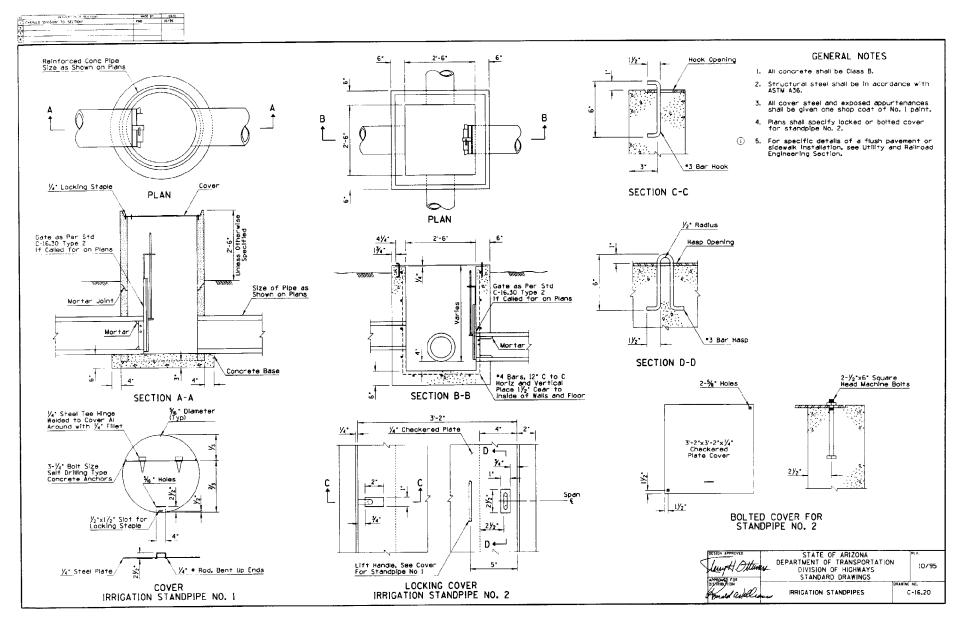
SECTION B-B

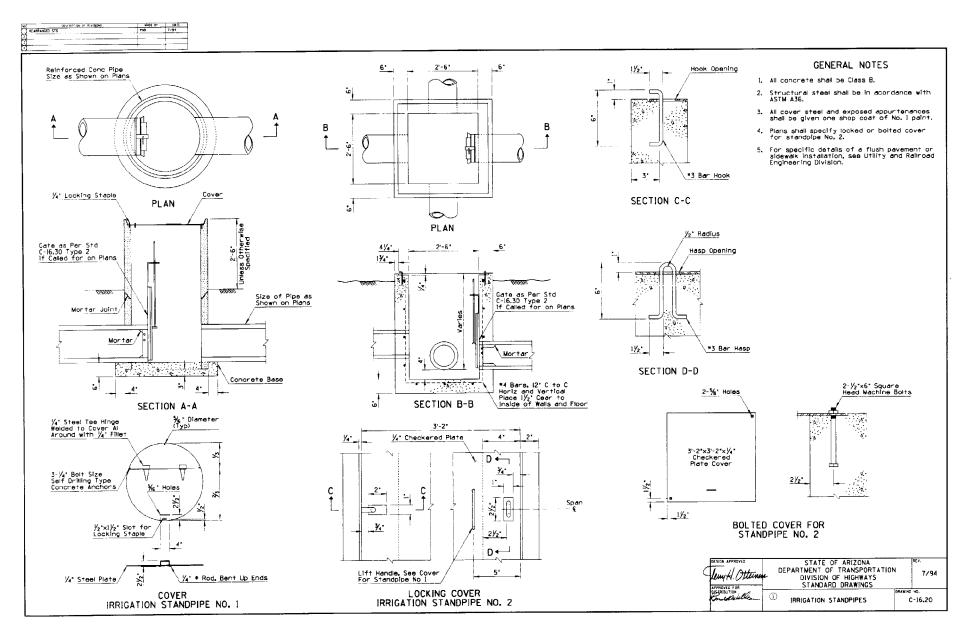
6.

- 1. All concrete shall be Class B.
- All reinforcing bars shall be "4 except two "6 bars over pipe. Bar spacing approximately l'-0" center to center unless otherwise noted.
- 30° wing wall flare shown; 45° normally desirable.
 See Hydraulics and Utility and Railroad Engineering Divisions.

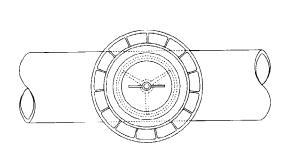
PIPE	DIMENSIONS			(CHADIC	ITIES
			_	CY Cor	crete	
ID	L	E	(Approx)	CMP	RCP	Reinf Steel Lbs
18*	2'-0"	1'-0"	19.	0.97	0.96	65
24"	2'-0"	1'-0"	1'-9"	1.11	1.07	78
30*	3'-0"	1'-6"	2'~7"	1.50	1.44	108
36'	4'-0"	20.	3'-6'	2.08	2.01	150
42"	5'-0"	2'-6"	4'-4"	2.71	2.63	205
48"	6'-0"	3'-0"	5'-2"	3.39	3.30	270
54"	7'-0"	3'-6"	6'-1"	4.14	4.02	335
60-	80.	4'-0"	6'-11"	4,96	4.80	410

	DESIGN APPROVED LEWY H. Otternes APPROVED FOR	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/94
tonald building	1 IRRIGATION HEADWALLS 18" TO 60" DIAMETER PIPES	C-16.10	

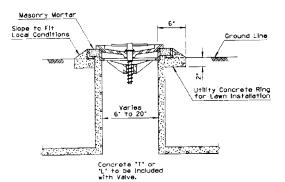






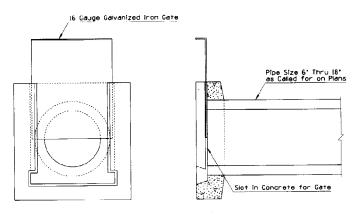


PLAN



Irrigation Valve Number of Valve Shall Correspond to the Size of Pipe in Inches. No 6 to No 20.

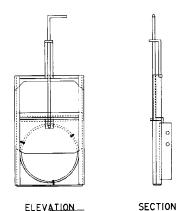
PART SECTION
FLUSH IRRIGATION VALVE



ELEVATION

SECTION

PRECAST IRRIGATION GATE For Open Ditch Installation TYPE 1

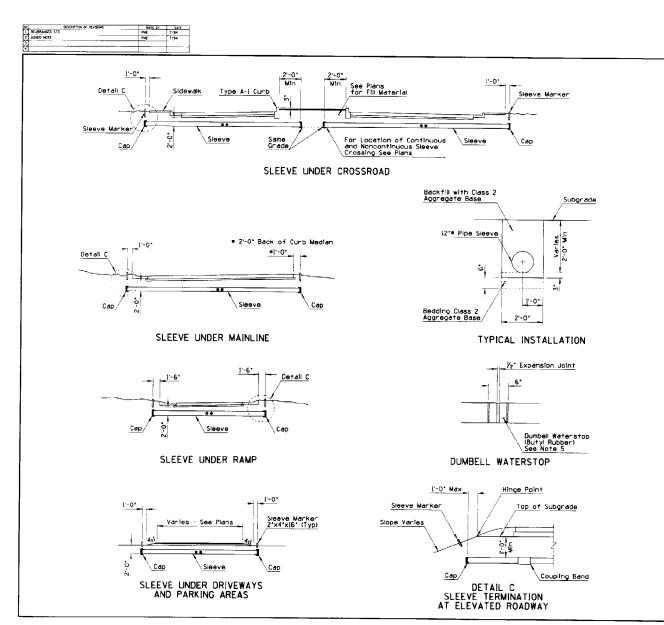


IRRIGATION GATE
For Standpipe Installation
TYPE 2

TYPE 2 IRRIGATION GATE

For pipes 6° through 24°, Cate and frame shall be galvanized iron. Type shown is for concrete pipe. For CMP, external steel adjustable band shall be used in place of internal steel ring.

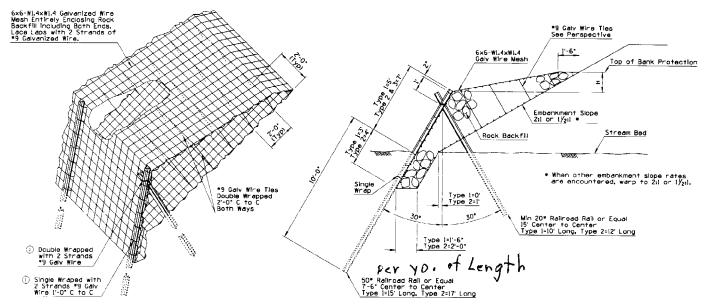
4	DES ON APPROVED LOUGH STEWNESS APPROVED FOR DISTRIBUTION Consideration	STANDARD DRAWINGS		7/9 4
		1 IRRIGATION VALVE AND GATE	C-	



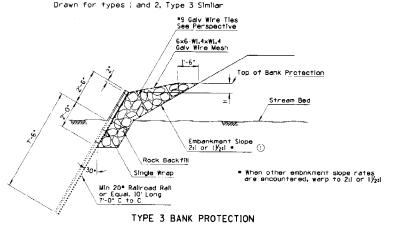
- Irrigation sleeves shall be installed in a trench condition. See Std C-13.15 and Std C-7.06.
- Bedding and backfill material shall be Class 2 Aggregate Base.
- Pipe installation shall conform to Section 501 of Standard Specifications.
- The Contractor shall imprint a 4'± high letter 5' on the face of all curbs at sleeve locations. The width of the letter shall be ½' and shall penetrate the concrete surface ½'.
- For non-continuous sleeves under crossroads, Std C-5,10 Type 'A-1' curb shall be required where median is irrigated. See plans for locations, Dumbell waterstop shall be at all expansion joints.
- 6. Materials used for caps or plugs shall be as recommended by the pipe supplier and approved by the Engineer.
 - Generally, sleeves shall be installed parallel to the roadway subgrade. Slope may vary in superelevated sections. Minimum slope nominal to drain.







TYPE 1 AND 2 BANK PROTECTION



PERSPECTIVE

2	TYPE	н	TOP OF BANK PROTECTION ABOVE THE STREAM BED
	3	0' to 2'	2' to 4'
	ı	0' to 3'	4' to 7'
	2	0' +0 6'	6' †o 12'

STATE OF ARIZONA

DEPARTMENT OF THRASPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS
STANDARD DRAWINGS
BANK PROTECTION, RAIL
TYPES I. 2. 3

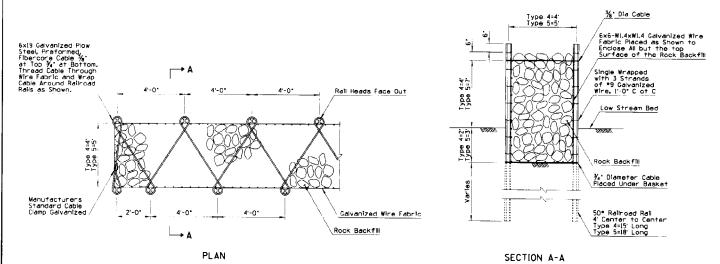
GENERAL NOTES

 Rock shall be sound and durable, of rounded or angular shape and with a nominal diameter of 8 minimum and 12 maximum. Flat or needle

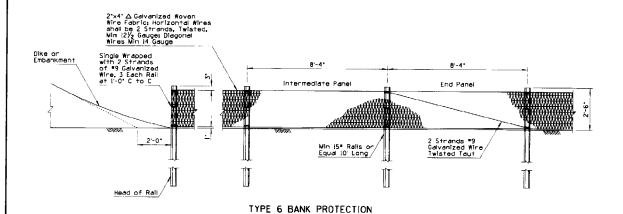
shapes are not acceptable.

2. Wire mesh spilce shall have a 6" minimum lap vertically and horizontally.





TYPE 4 AND 5 BANK PROTECTION



STATE OF ARIZONA

STATE OF ARIZONA

STATE OF ARIZONA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

TOUR BUTTON
THE STANDARD DRAWINGS

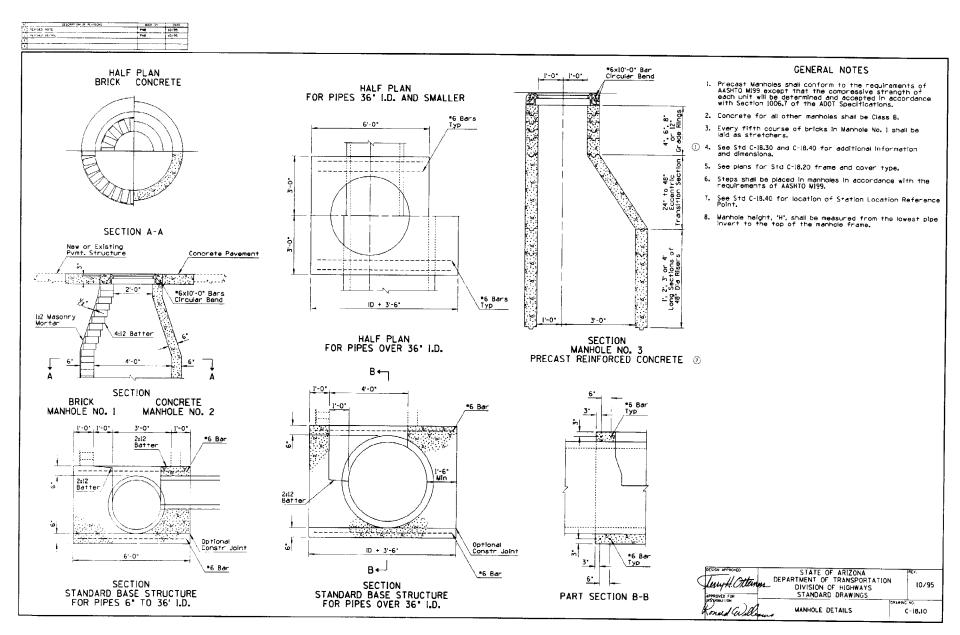
TH

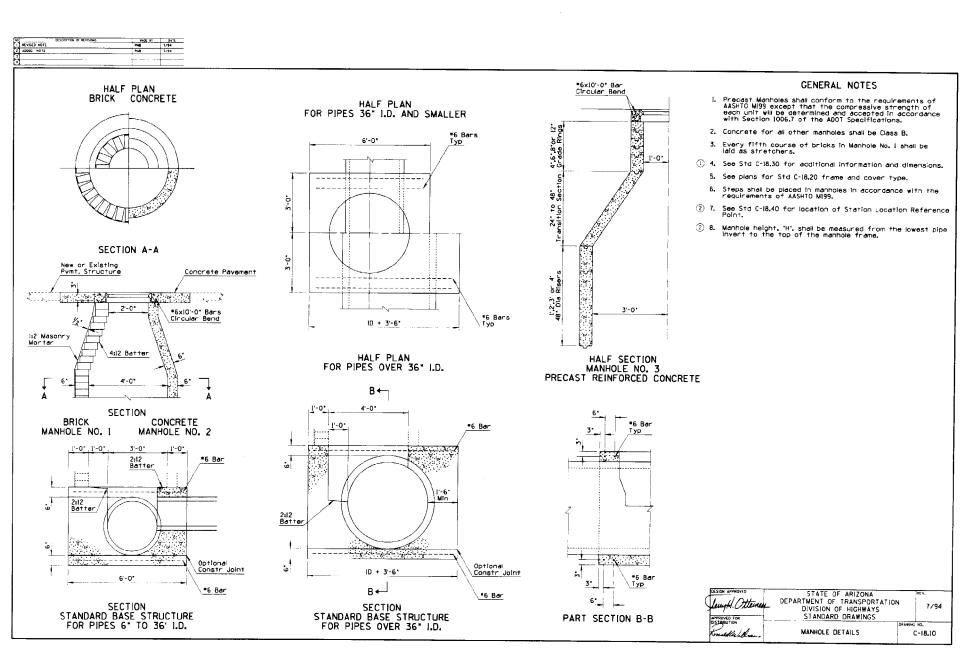
 Rock shall be sound and durable, of rounded or angular shape and with a nominal diameter of 8" minimum and 21" maximum. Flat or needle

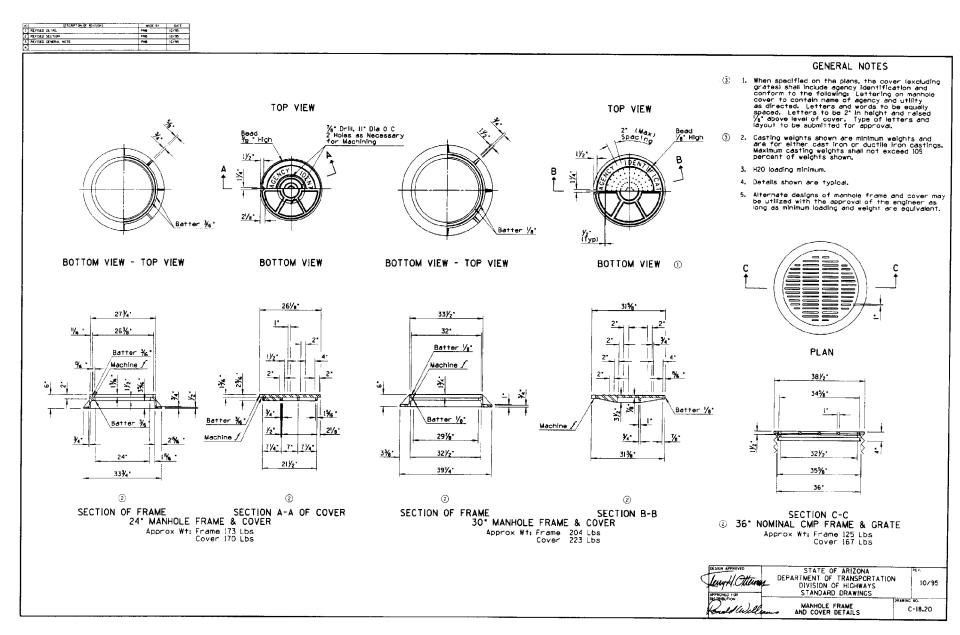
shapes are not acceptable. Rock shall be comprised of 50% min 8° to 12° and 5% max 18° to 21°.

2. Wire mesh splice shall have a 6" minimum lap

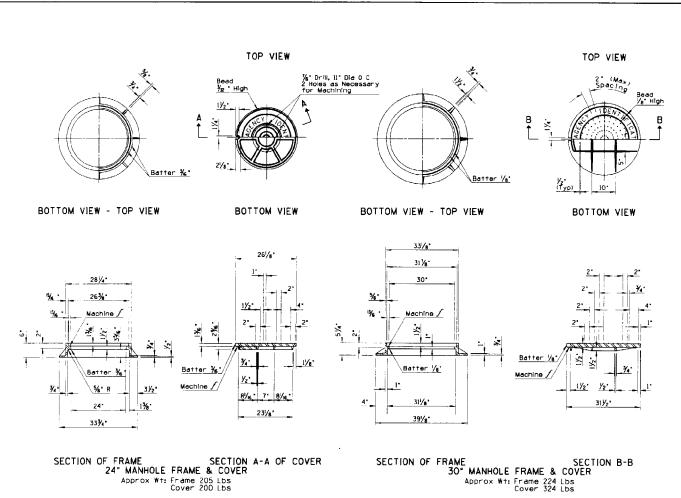
vertically and horizontally.



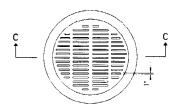




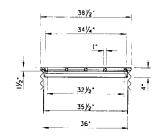




- I. When Type A' cover (24° or 30°) is specified on the plans then the cover shall include agency identification and conform to the following: Lettering on manhole cover to contain name of agency and utility or as directed. Letters and words to be equally spaced, Letters to be 2° in height and raised ½° above level of cover Type of letters and layout to be submitted for approval. Castings shall be painted or dipped in commercial quality asphaltum paint, unless otherwise specified.
- Weight of castings shall not be more than 2% less than the approximate weight specified.
- 3. H20 loading minimum.
- 4. Details shown are typical.
- Alternate designs of manhole frame and cover may be utilized with the approval of the engineer as long as minimum loading and weight are equivalent.



PLAN

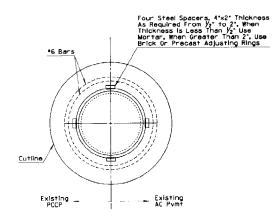


SECTION C-C 36° CMP FRAME & GRATE Approx Wt: Frame and Cover = 330 Lbs

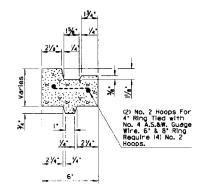
STATE OF ARIZONA

| Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Contro

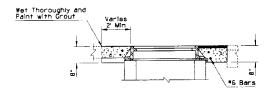
| NO | (6.55 (19.75 (19



PLAN



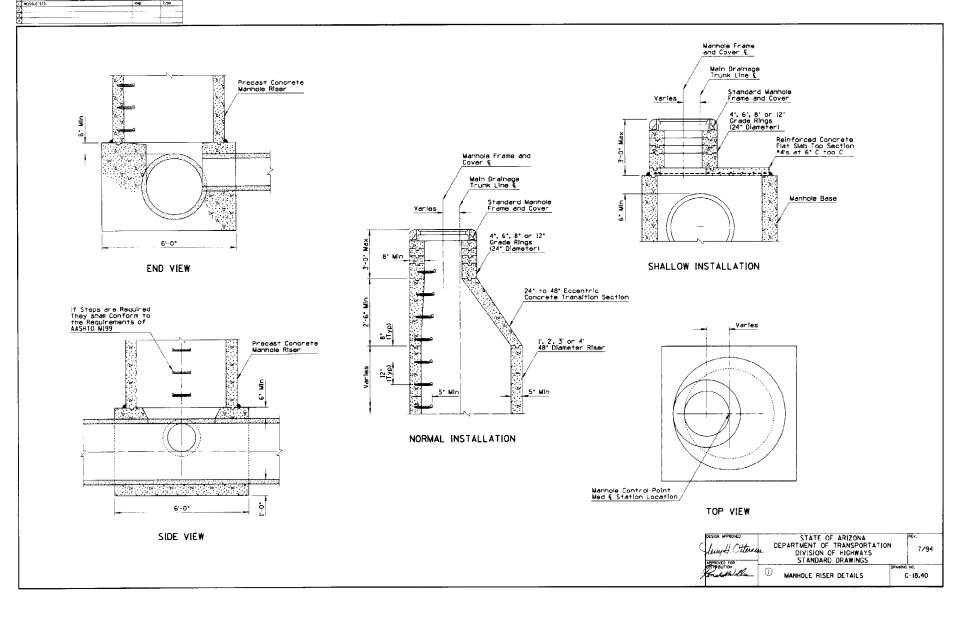
PRECAST ADJUSTING RING DETAIL



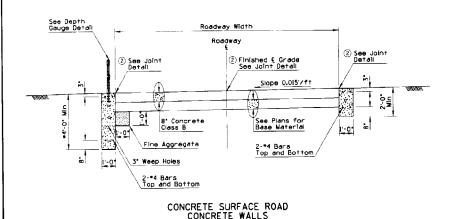
SECTION
MANHOLE COVER FRAME
ADJUSTMENT - PAVEMENT
CUT AND REPLACEMENT

- 1. All dimensions are minimum except where noted.
- 2. Location & elevation shown on plans.
- 3. Compaction to conform to Sect. 303-2 or 501.

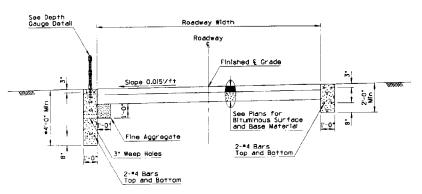




340	DESCRIPTION OF REVISIONS	MALE HA	Eja TE
1 REARRANGED S10		PNS	1/94
2 REVISED NOTE		PNB	7/94
3 AODES DETAIL		PNB	7/94



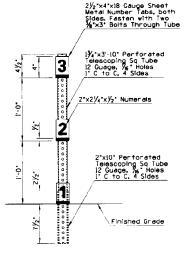
* Min Distance Below Stream Bed

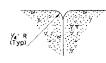


BITUMINOUS SURFACE ROAD CONCRETE WALLS

GENERAL NOTES

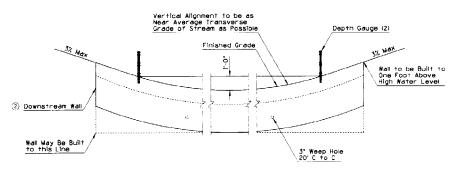
- i. Ford walls shall be Class B concrete.
- Depth gauge tubing shall be protected against concrete entering through bottom or perforations,
- Depth gauge tubing and both sides of numeral tabs shall be painted with two coats of white enamei. Numerals and markers shall be painted with one coat of gloss black enamei.





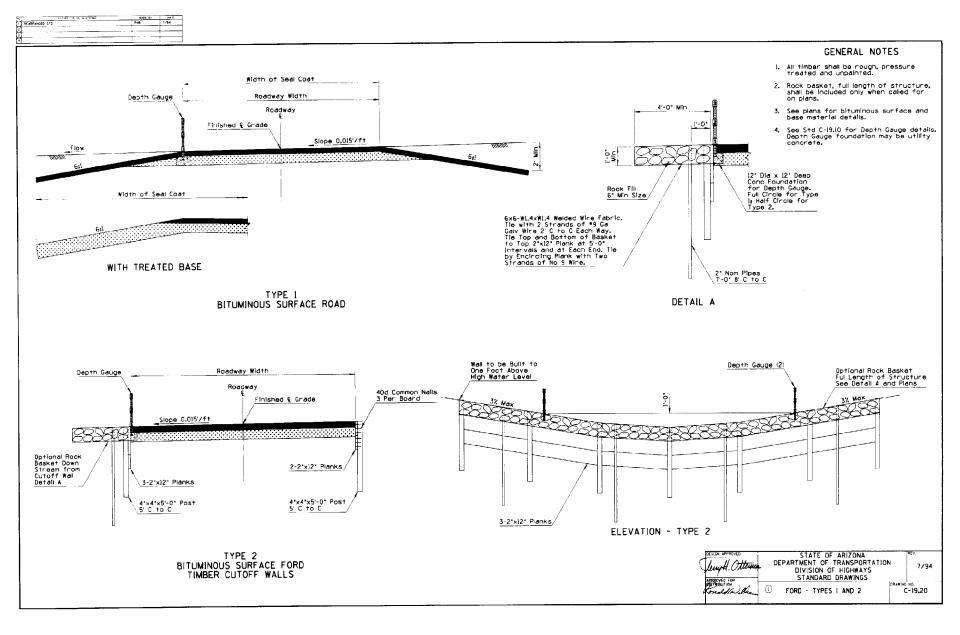
3 JOINT DETAIL

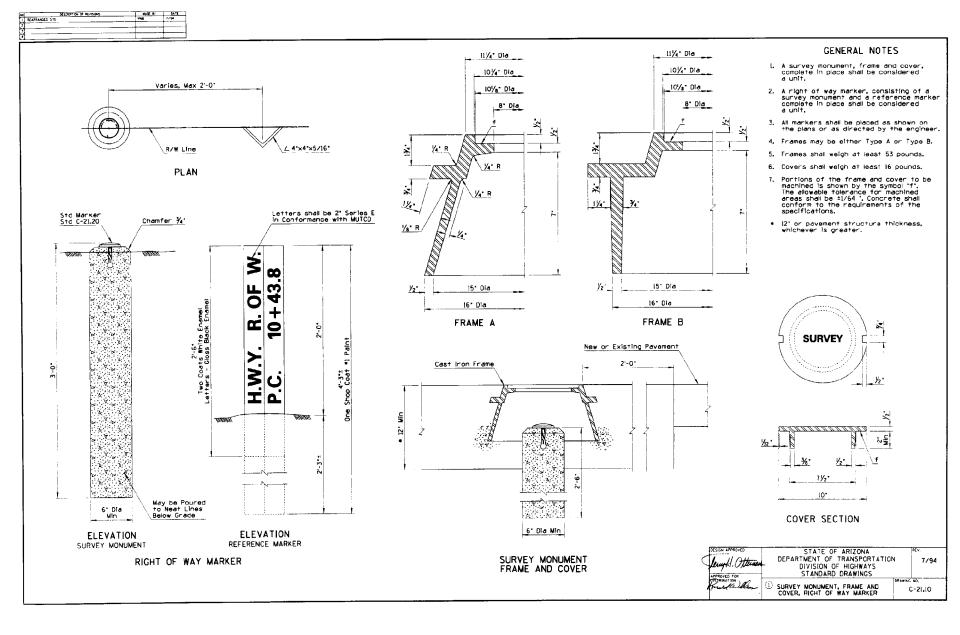
DEPTH GAUGE DETAIL

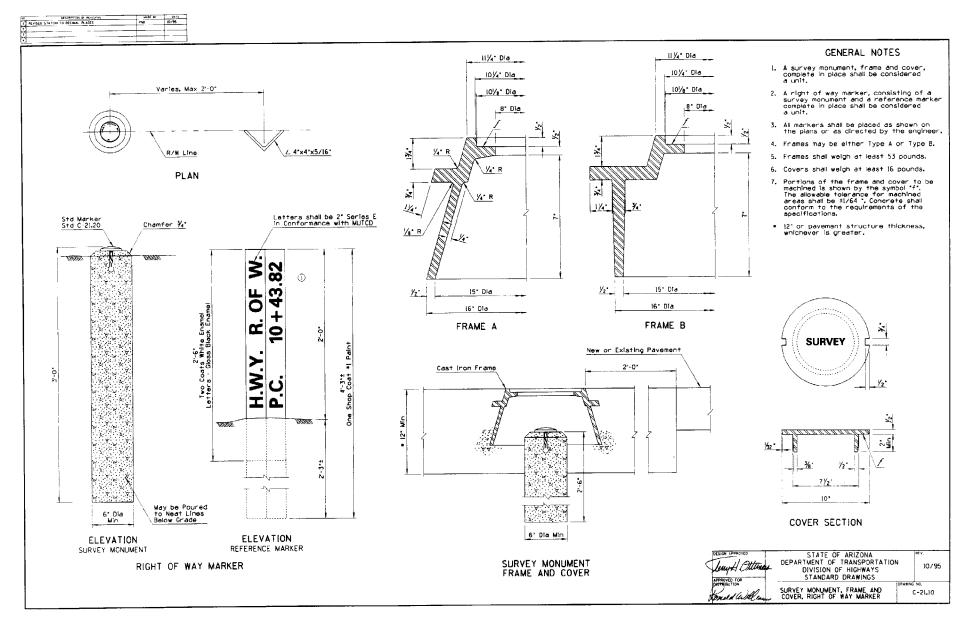


ELEVATION LOOKING UPSTREAM

_	Lewy H. Otherner	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/94
- 1	Ronal Head Dia	FORD - CONCRETE WALLS	C-19,10



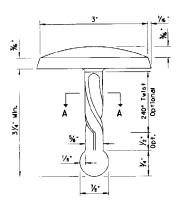








PLAN



ELEVATION STANDARD MARKER

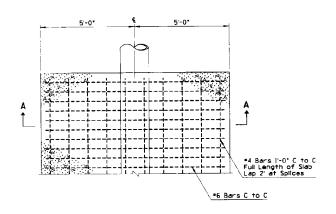


SECTION A-A

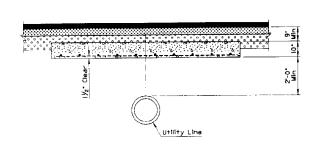
- Standard Marker may be used as bench, survey monument or R/W markers.
- 2. Standard Marker shall be made of brass, bronze or aluminum.
- Standard Marker will be furnished by the Department. Cast-in lettering format may vary.
- Bench Marks shall be established on headwalls, bridge curbs or other permanent structures.
- 5. Surfaces of Aluminum Markers in contact with concrete shall be epoxy coated.
- 6. Fluted shank may be straight or twisted.
- Station, Elevation, Year, or other information shall be hand stamped in field, as approved by the Engineer.



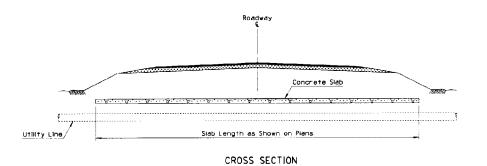
1. All concrete shall be Class B.



FOR SINGLE	INSTALLATION
QUANTITIES PER F	T OF SLAB LENGTH
CONCRETE	REINFORCING STEEL
0.31 CY	35.22 Lbs

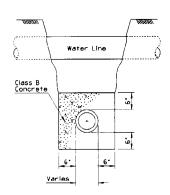


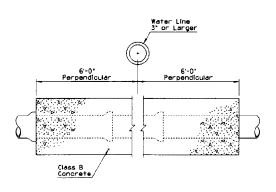
SECTION A-A



LULY H OTHER	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATIO DIVISION OF HIGHWAYS STANDARD DRAWINGS		7/94
presention brasilia.	1 UTILITY LINE, PROTECTIVE CONCRETE SLAB	DRAWING	+0. -22 . 10







TYPE A ENCASEMENT

- Type A encasement to be used for sewer laterals or house connections BELOW water lines.
- Type B encasement to be used for sewer laterals or house connections ABOVE water lines.
- The encasement shall extend at least 6' on each side of the water line and must include the nearest joint.
- Protection for Type A required when distance from bottom of water to top of sewer line is 24" or less. When the sewer is a 4" or 6" house connection no protection is required if distance is more than 12".
- For Type A crossings, Class 150 C.I.P. or ductile iron pipe may be used as an alternate. For Type B crossing reinforced encasement is always required.

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

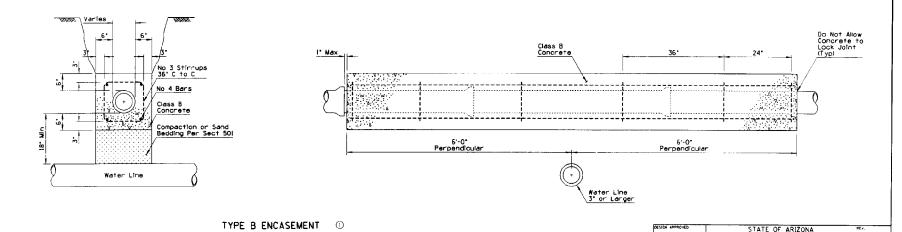
STANDARD DRAWINGS
SANITARY SEWER ENCASEMENT

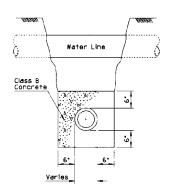
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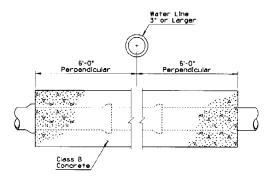
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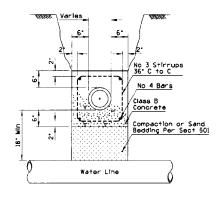
TYPE A ENCASEMENT

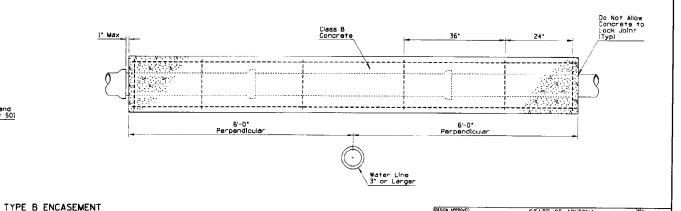
- Type A encasement to be used for sewer laterals or house connections BELOW water lines.
- Type B encasement to be used for sewer laterals or house connections ABOVE water lines,
- The encasement shall extend at least 6' on each side of the water line and must include the nearest joint.
- ① 4. Protection for Type A required when distance from bottom of water to top of sewer line is 24' or less. When the sewer is a 4' or 6' house connection no protection is required if distance is more than 12'.
 - For Type A crossings, Class 150 C.I.P. or ductile iron pipe may be used as an alternate. For Type B crossing reinforced encasement is always required.

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION

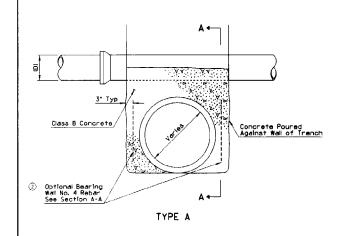
DIVISION OF HIGHWAYS STANDARD DRAWINGS SANITARY SEWER ENCASEMENT 7/94

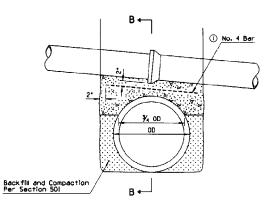
C-22.15



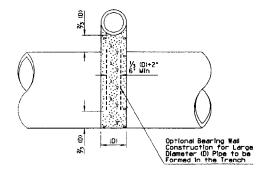




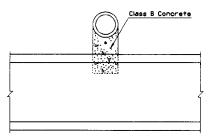




TYPE B



SECTION A-A



SECTION B-B

GENERAL NOTES

- Type A pipe support may be used for any Type crossing condition.
- Type C pipe support may be used for crossing pipes with a bell diameter of 18' or less if sufficient clearance over storm sewer is available and total span is less than 34'.
- intermediate pipe support shall be used in conjunction with Type C pipe support if total span exceeds max. W in table.
- The contractor shall be responsible for furnishing all supports both permanent and temporary. Temporary supports shall not be a separate pay Item.
- Permanent pipe supports may be decreased from pian quantities or extended to include some listed below as temporary supports if conditions warrant these changes at the time of construction. Decision shall be made by the engineer.
- When Type A pipe support is used and whenever so directed by the anineer, the contractor shall pierce the wall with suitable openings to prevent unequal pressure resulting from flooding of the backfill. The volume of the pierced opening shall not exceed ½ the volume of the supporting wall.
- Use Type B pipe support instead of Type C when clearance between pipes is less than Y in table.
- (i) 8. Concrete cover for reinforcing steel shall be 3°, minimum.

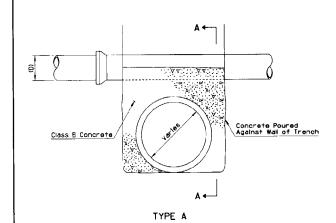
SCHEDL	JLE OF REQUI	RED SUPPORTS	
PERMANENT	TEMPORARY		
Sewer Lines	Cast Iron Pipe	Conc Storm Drain	
	Conc irrig Pipe	Conc Box Culvert	
	Burled Telco	Traffic Control Conduit	
	Gas Pipes	Water and Sewer Lines	

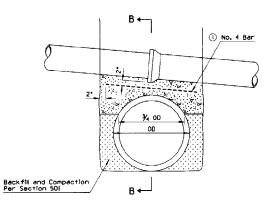
NOTE: Other utilities as noted on the plans or as required by the engineer at time of construction.

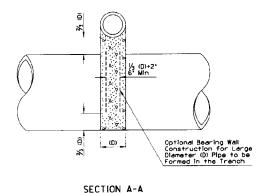
LLINGH OHLUNG	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	10/95
And saidle	PIPE SUPPORT ACROSS TRENCHES	C-22.20

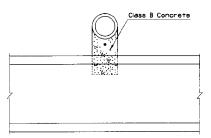
Sheet L of 3











TYPE B

SECTION B-B

GENERAL NOTES

- Type A pipe support may be used for any Type crossing condition,
- Type C pipe support may be used for crossing pipes with a bell diameter of 18or less if sufficient clearance over storm sewer is available and total span is less than 3d.
- Intermediate pipe support shall be used in conjunction with Type C pipe support if total span exceeds max. W in table.
- The contractor shall be responsible for furnishing all supports both permanent and temporary, Temporary supports shall not be a separate pay Itam.
- Permanent pipe supports may be decreased from plan quantities or extended to include some listed below as temporary supports if conditions warrant these changes at the time of construction. Decision shall be made by the engineer.
- 6. When Type A pipe support is used and whenever so directed by the engineer, the contractor shall plerce the wall with suitable openings to prevent unequal pressure resulting from flooding of the backfill. The volume of the pierced opening shall not exceed ½ the volume of the supporting wall.
- ① 7. Use Type B pipe support instead of Type C when clearance between pipes is less than Y in table.

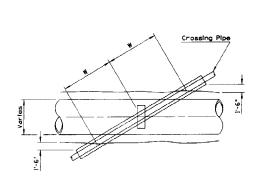
SCHEDL	LE OF REQUI	RED SUPPORTS	
PERMANENT	TEMPORARY		
Sewer Lines	Cast Iron Pipe	Conc Storm Drain	
	Conc irrig Pipe	Conc Box Culvert	
	Burrled Telco	Traffic Control Conduit	
	Gas Pipes	Water and Sewer Lines	

Other utilities as noted on the plans or as required by the engineer at time of construction.

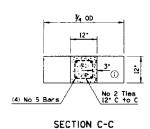
Lewy H Otherne	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/94
meddialliams	PIPE SUPPORT ACROSS TRENCHES	E-22.20 heet 1 of 3

Š	DESCRIPTION OF NEVISIONS	MOC BY	DAT
7	REVISED REBAR CLEARANCE	PHB	10/95
2			
3			

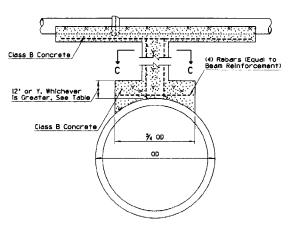
		TABLE		
	DEP	TH OF COV	ER ON SUPPOR	RTS
	0' T	O' TO B'		16'
.₩.	BAR NO.	Y	BAR NO.	۲
TO 6'	5	8,	6	11.
7'	5	9.	6	12-
8.	5	10"	6	13*
ð.	6	II.	6	14"
10'	6	12*	7	15*
111	6	13*	7	16"
12'	6	14*	7	17-
13'	7	15*	7	19*
14'	7	16*	8	20*
15'	7	17*	8	21*
16'	7	18*		
171	8	19*		



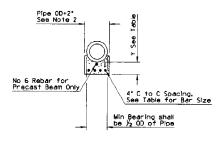
PLAN FOR TYPE B SUPPORT



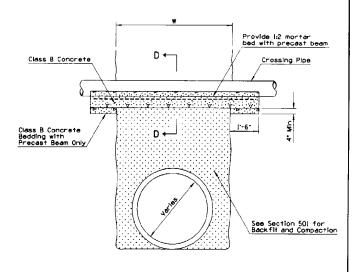




INTERMEDIATE SUPPORT FOR TYPE B CROSSINGS



SECTION D-D

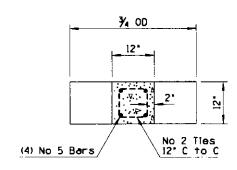


TYPE C

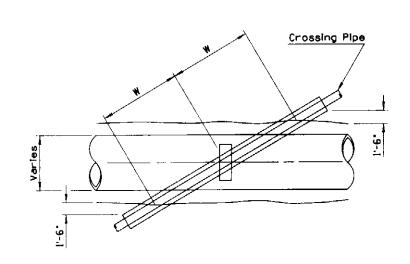
DESIGN APPROVED LUBY / Ottomby APPROVED FOR	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	10/95
Tordelle Dan	PIPE SUPPORT ACROSS TRENCHES	C-22,20 Sheet 2 of 3

40 i	DESCRIPTION OF REVISIONS	MADE BY	DATE
RE	ARRANGED STD	PNB	7/94
2			
3			1

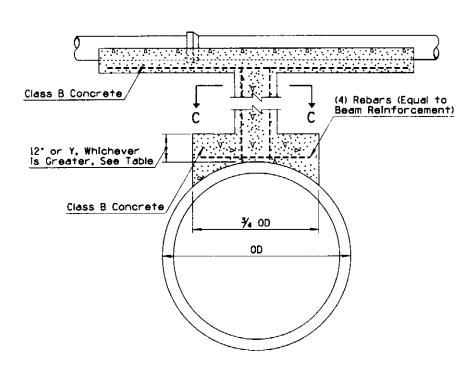
		TABLE		
	DEP	TH OF COV	ER ON SUPPOR	RTS
	ο, τ	0 8'	8 [,] TO	TO 16'
' W '	BAR NO.	Y	BAR NO.	Y
10 6 ,	5	8.	6	11*
7'	5	9,	6	12"
8'	5	10*	6	13"
9,	6	11"	6	14"
10'	6	12"	7	15"
11'	6	13*	7	16"
12'	6	14*	7	17*
13'	7	15"	7	19*
14'	7	16.	8	20.
15'	7	17"	8	21*
16'	7	18*		,
17'	8	19.		



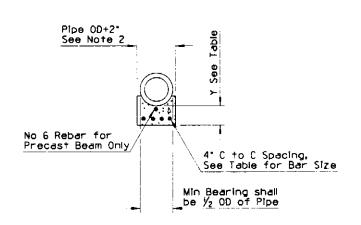
SECTION C-C



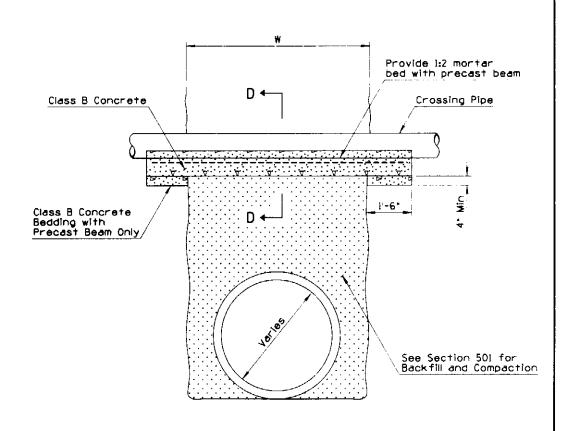
PLAN FOR TYPE B SUPPORT



INTERMEDIATE SUPPORT FOR TYPE B CROSSINGS

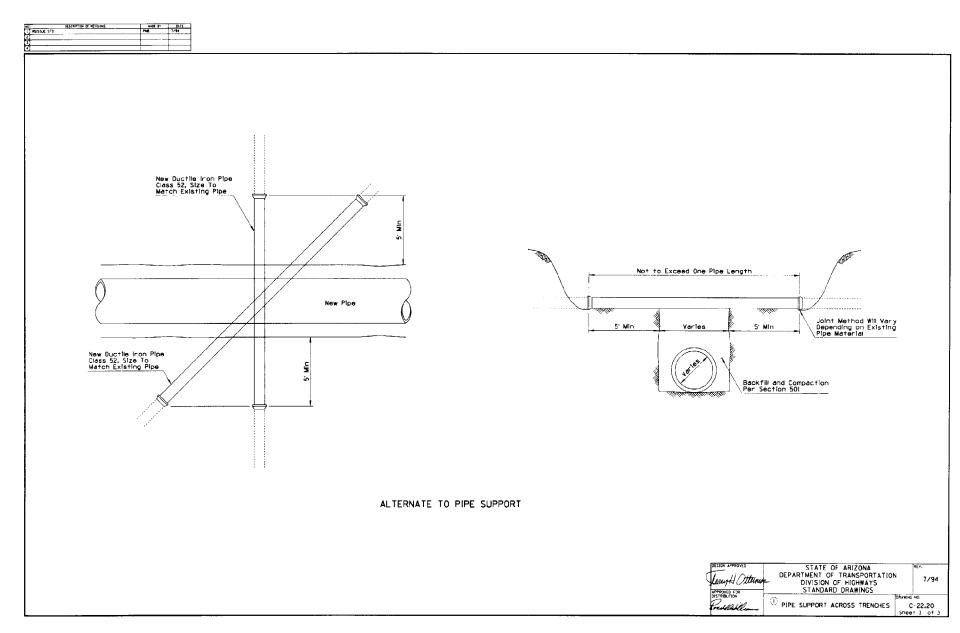


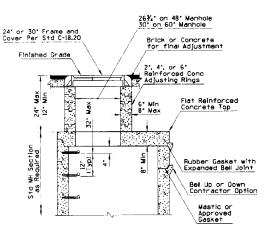
SECTION D-D



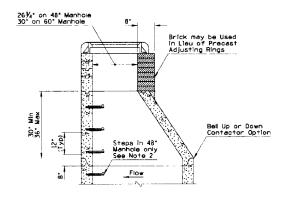
TYPE C

4	LEWITH OTHER	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/94
- 1	OISTRIBUTION	(1)	WING NO. C-22.20
-1	medalliero		heet 2 of 3





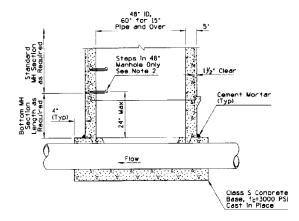
TYPE B TOP



TYPE A TOP Pre-Cast Eccentric Conical Top Manhole

Cement Mortar

(Typ)



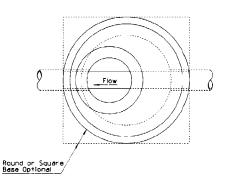
PRECAST SEWER MANHOLE

4" (Typ)

Cast In Place.

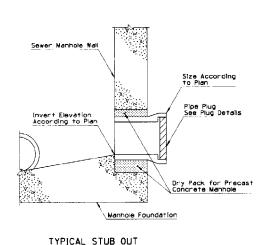
Pressed into Base

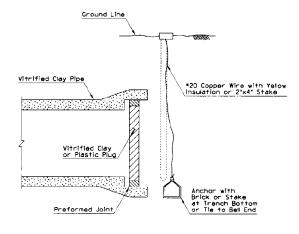
- Pre-cast, reinforced menhole sactions shall be manufactured in accordance with AASH10 MI99 except that the compressive strength of each unit will be determined and accepted in accordance with section 1006.7 of the specifications.
- Manhole steps shall be installed at the site of the manhole section manufacture in accordance with Industry standards meeting AASHTO MI99 requirements, Steps not required in 60° manhole.
- Use low alkali cement only.
- 4. Pipe sizes and elevation shown on plans.
- Frame and cover shall be adjusted to the finished grade prior to placing of the asphaltic concrete or PCCP surface.



	DESIGN APPROVED	STATE OF ARIZONA	REV.
1	Lunght Otternus Approven ein	DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/94
æ	OF ST HIBLITION	PRECAST SANITARY SEWER MANHOLES	C-22.25

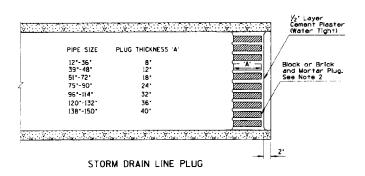


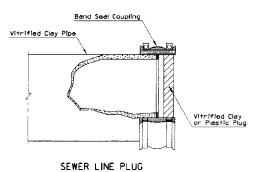




PIPE PLUG MARKER

- Compact soil at end of pipe to 95% of maximum density.
- If depth of cover is less than 5' or greater than 10', increase plug thickness a minimum of 4'.





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DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

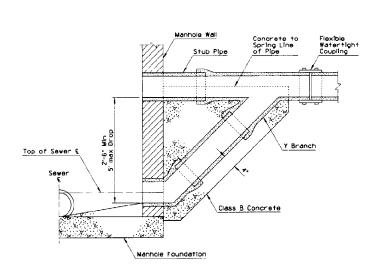
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

DRAWING NO.

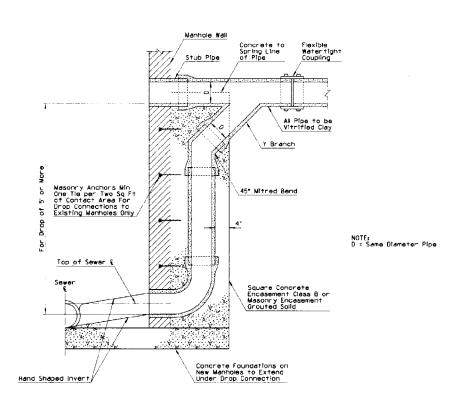
STUB OUT AND PLUC

C-22.30

NO.	DESCRIPTION OF PREVISIONS	MAD: 81	DATE
I REISSUE STO		FH6	7/94
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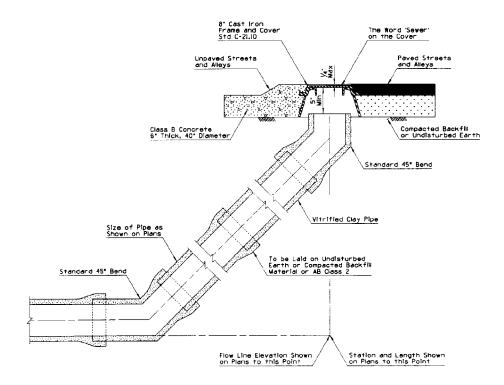
TYPE A 2.5' TO 5' DROP



TYPE B 5' OR MORE DROP

Lerry - Otterne	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATIO DIVISION OF HIGHWAYS STANDARD DRAWINGS	N	7/94
Home fle shear	DROP SEWER CONNECTIONS	DRAWING	

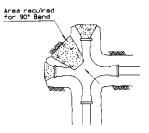
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I REISSUE STD	MB	7/34
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	-	7

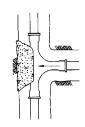


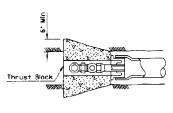
CLEANOUT INSTALLATION

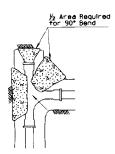
V	IGN APPROVED WALL Officeres	STATE OF ARIZONA DEPARTMENT OF TRANSPORT. DIVISION OF HIGHWAYS STANDARD DRAWINGS		7/94
15	refulla.	① SEWER CLEANOUT	DRAWING	но. -22.40

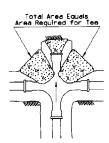
DESCRIPTION OF REVISIONS	MADE B1	DATE
REARRANGED STD	PHS	7/94
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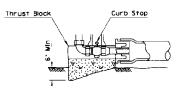


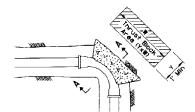














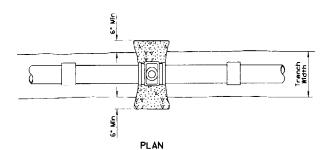
SECTION A-A

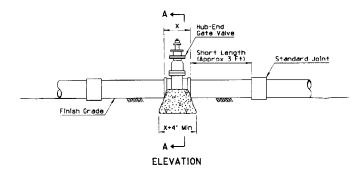
- 1. Thrust blocks are to extend to undisturbed ground.
- 2. All concrete shall be class B.
- Table is based on 3000*/sq. ft. soil. If conditions are found to indicate soil bearing less, the areas shall be increased accordingly.
- Areas for pipe larger than I6° shall be calculated for each project.
- 5. Form all non bearing vertical surfaces.

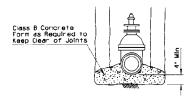
MINIMUM THRUST BLOCK AREA REQUIRED (Y × W)			
PIPÉ	WATE	R PIPE	
SiZE	TEE, DEAD END, 90° BEND	45" & 22 //2" BENDS	
4" & LESS	3 SQ. FEET	3 SO. FEET	
6-	4	3	
8.	6	3	
10*	9	5	
15.	13	7	
16*	23	15	

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Temy HOtteman	DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	7/94
APPROVED FOR	STANDARD DRAWINGS	
Bred/William	THRUST BLOCKS FOR WATER LINES	C-23.10

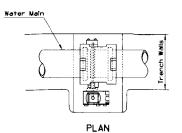


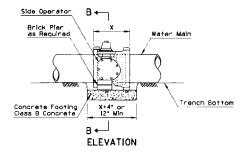




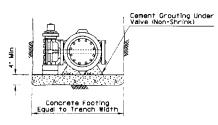


SECTION A-A GATE VALVE





- Gate valves 4° to 16° may be used with any type of pipe.
- Gate valves larger than 16° to be detailed on plans.
- Butterfly valves 3" to 12" may be used with any type of pipe.
- Butterfly valves larger than 12° to be detailed on plans.
- Valve box and cover required per Std C-23.30.



SECTION B-B BUTTERFLY VALVE

STATE OF ARIZONA

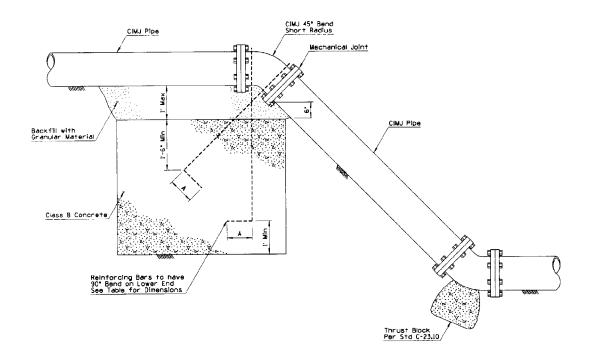
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

TYPHILIPM

BLOCKING FOR WATER VALVES
GATE AND BUTTERFLY

C-23.15

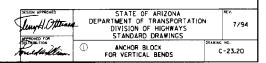
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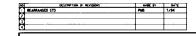


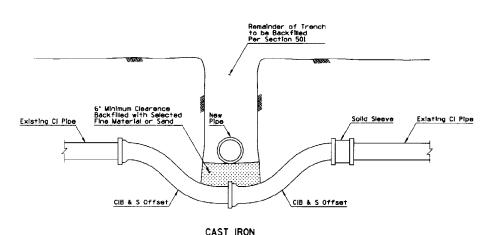
- Either this detail or restraint rods may be used when allowed to relocate a water line upward to cross over a conflict.
- 2. Ductile Iron pipe may be used.
- Anchor blocks for pipe larger than 12* shall be calculated for each project.
- Reinforcing bars to be coated with 2 coats of coal tar, epoxy, or by other approved methods.

PIPE SIZE	MINIMUM BAR SIZE	A-DIMENSION (HOOK)	MINIMUM * BLOCK DIMENSION
6.	*6	6"	3'x3'x3'
8.	•6	9"	4'×4'×2.5'
12*	*8	9"	4'x5'x5'

* For 125 psi Working Pressure







- This detail covers moving of water mains, 2" to 12" only.
- 2. Thrust blocking per Std C-23.10 and C-23.20.
- If offset is to go over obstruction, joint restraints must be used.
- 4. Pipe is to be cast iron or ductile iron.
- 45° cast iron bends may be used in place of cast iron offsets.
- Brop section is to be prefabricated and installed as a single unit for cast iron mechanical joints.

STATE OF ARIZONA

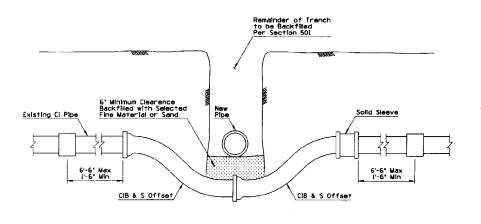
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

STANDARD DRAWINGS
VERTICAL REALIGNMENT

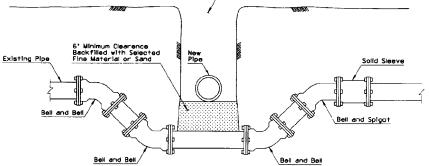
OF WATER MAINS

7/94

C-23.25

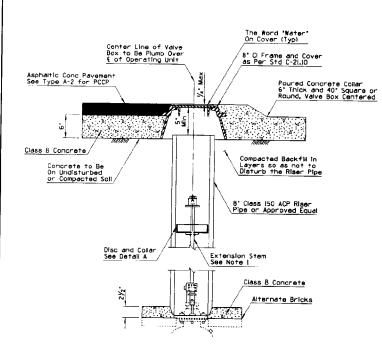


ASBESTOS CEMENT

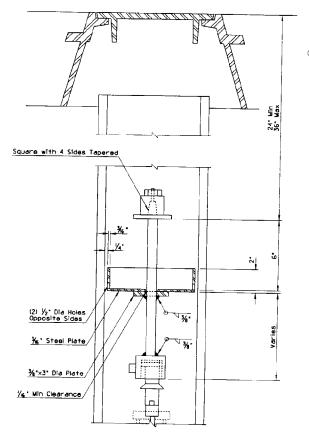


CAST IRON MECHANICAL JOINT

lung H. Otherne

Remainder of Trench to be Backfilled Per Section 501 

TYPE A-! TO BE USED IN AREAS SUBJECT TO VEHICULAR TRAFFIC



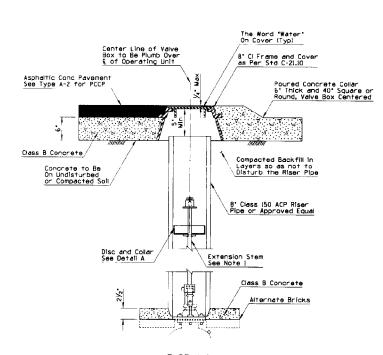
GENERAL NOTES

- Extension to valve stems required on all valvas where operating nut is over 5 below surface. Extension stem shall be 1/4' minimum diameter steal designation A-15, with squera socket on bottom to fit 2' square valve nut, Langth to fit each installation, 2' square operating nut to be held on top of the extension stem with stop nut.
- If two or more joints of ACP are used to make riser, use standard AC pipe rubber gasket coupling to join pipe. Where riser pipe length exceeds 10', use 12' AC pipe.
- All steel to have prime coat of paint No. 4 and one heavy application (finish coat) of Light Grey Enamel paint as per section 1002-4.06.
 - Valve box shall be adjusted to the finished grade prior to the placing of the asphaltic concrete surface or PCCP.
 - Ground below the concrete pad or three bricks to be compacted to 95% of the maximum density.
 - Use Parkson, Tyler Apco, or equal deep skirted cover (4" or more) type, silding adjustable cast iron valve box, Ci minimum TS 30,000 psi.

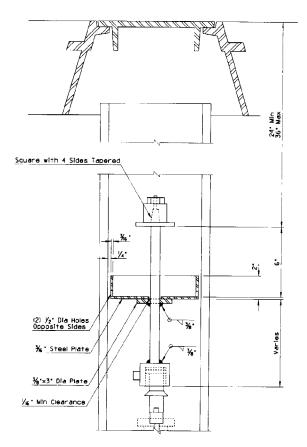
DETAIL A

STATE OF ARIZONA

| Comparison of the property
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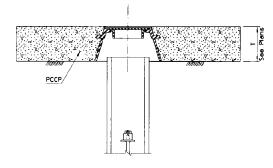
TYPE A-1
TO BE USED IN AREAS SUBJECT TO VEHICULAR TRAFFIC



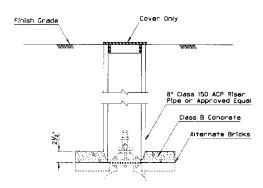
DETAIL A

- 1. Extension to valve stems required on all valves where operating nut is over 5' below surface. Extension stem shall be 1½' minimum diameters attell designation 4.5s, with square specter on bottom to fit 2' square valve nut. Length to fit each installation. 2' square operating nut to be held on top of the extension stam with stop nut.
- if two or more joints of ACP are used to make riser, use standard AC pipe rubber gasket coupling to join pipe. Where riser pipe length exceeds 10', use 12' AC pipe.
- All steel to have prime coat of paint No. 4 and one heavy application (finish coat) of paint No. 10092-4.06 as per section 1002.
- Valve box shall be adjusted to the finished grade prior to the placing of the asphaltic concrete surface or PCCP.
- ② 5. Ground below the concrete pad or three bricks to be compacted to 95% of the maximum density.
- ② 6. Use Parkson, Tyler Apco, or equal deep skirted cover (4° or more) type, sliding adjustable cast iron valve box, Cl minimum TS 30,000 psi.

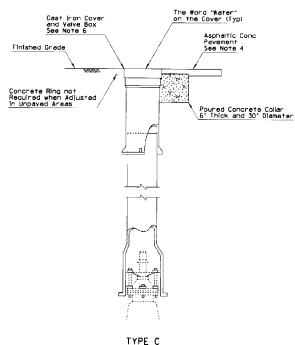




TYPE A-2 TO BE USED WHEN VALVE BOX IS LOCATED WITHIN PCCP PAVEMENT

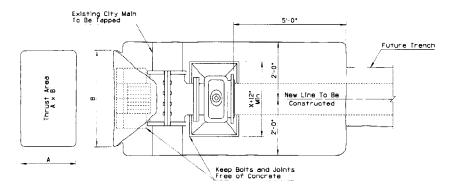


TYPE B NOT SUBJECT TO VEHICULAR TRAFFIC

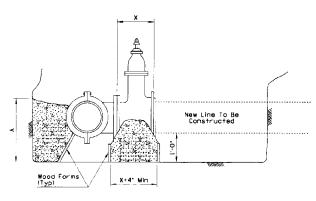


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DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS 7/94 STANDARD DRAWINGS VALVE BOX INSTALLATION C-23.30 Konskialle Sheet 2 of 2





PLAN



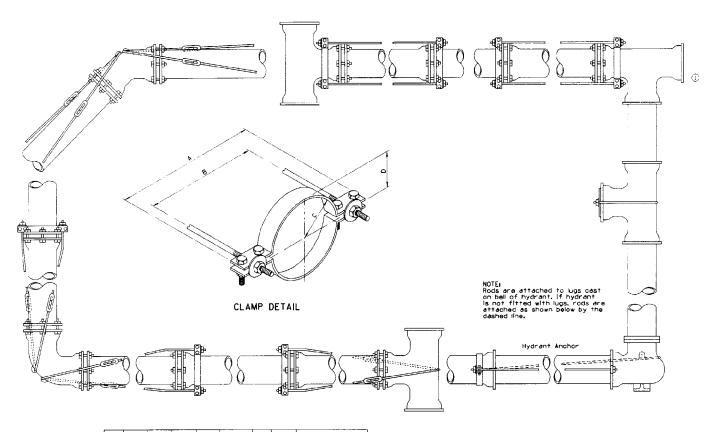
ELEVATION

- 1. Thrust blocks are to extend to undisturbed ground,
- Optional blocking of 2"x8"x12" solid concrete masonry units may be used as indicated.
- All concrete shall be class B normally, cure 24 hours before backfilling, or use high, early strength concrete.
- All taps shall be made by city crews at prevailing rates.
- Install permanent blocking under valve before tap is made. All flange bolts shall be clear of footing.
- All tapping sleeves must be pressure tested prior to request for tap by city.
- Contractor shall excavate as shown and shall set tapping sleeve and valve, and tighten all bolts prior to requesting city to make tap.
- Tapping sleeve to be placed a minimum of 18° from any bell, coupling, valve, or other obstruction.
- Areas for pipe larger than 16° shall be calculated for each project.

SIZE OF PIPE BEING CONNECTED	MINIMUM THRUST AREA REQUIRED EQUALS (A × B)
4" & LESS	3 SQUARE FEET
6-	4 SQUARE FEET
8*	6 SQUARE FEET
10-	9 SQUARE FEET
12*	13 SQUARE FEET
16*	23 SOUARE FEET

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the ald listle and	TAPPING SLEEVE AND VALVE INSTALLATION	C-23.35





PIPE		В		D	CLAMP	000	ROD BOLTS	₩ASH	ERS
PIPE SIZE	A	В	С	, D	CLAMP	RUD		CAST IRON	STEEL
4.	121/2"	101/8"	2/2.	13/4.	1/2°×2°	¥4.	%	%·×3·	1/2"×3"
6.	141/2"	121/8*	3%.	211/6°	1/2"×2"	₹4.	5%.	%'×3'	/2"x3"
8.	1674	143/8"	43/32	37/2	%,×2/2,	¥4.	%.	%'×3'	1/2"×3"
10.	191/16"	16"/6"	5/4	5.	%.×2/2.	%.	y ₄.	% ×3	1/2"×3"
12.	22 %	19%	674.	51/8°	5/k"×3"	½·	γ,	₹4°×3½°	1/2"×31/2"

- This detail is for use only on underground installations where the use of concrete thrust blocking per Std 6-23,10 cannot be used because of obstructions, or requirements of the specifications.
- Washers may be cast Iron or steel, and may be round or square. Holes shall be 1/8 inch larger than the rods.
- 3. Ai tie rods, rod couplings, turnbuckles, bolts and nuts for these joints shall be of carbon steel equivelent to ASIM A=307, grade B, with cadmium that the minimum thickness of the plating shall be .0002 of an inch. Cadmium plated bolts shall have class 2A threads and the nuts, rod couplings and turnbuckles shall have 2B threads.
- 4. High strength, heat treated cast iron tee-head bolts with hexagon nuts, all in accordance with the strength requirements of AWWA C-III, may be used in lieu of the cadmium plated bolts and nuts.
- 5. The sketches in this series of figures show acceptable methods of providing anchorage. There is no particular significance to be attached to whether the sketch shows a bell and spigot joint or a standard mechanical joint. The anchoring procedure illustrated applies in most cases to either type of joint, in some cases, dimensions of the particular pipe or hub and space available for working around the particular joint will influence the choice of methods used.
- 6. In certain assemblies of rod and clamps shown, rods run from a lug on the fitting (or a clamp behind the hub of a belil to a clamp against a face of a bell. Note that this arrangement anchors only one joint. The stability of the joint where the clamp is against the face of the bell depends on having soil above a relatively long plece of pipe on both sides of the joint. Consecuently if the distance between the first consecuently of the distance between the first second joint shown shell be anchored by a clamp betind the hub of the bell and rods to a clamp at the face of the next bell.
- For pipe larger than 12 inch diameter, restraint details shall be submitted for approval prior to installation.
- All exposed metal shall be coated with asphaltic primer per subsection 907-2.02.
- 9. Bolt holes in clamps shall be ${\ensuremath{/_{\!\!16}}}$ inch larger than the bolts.

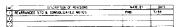
STATE OF ARIZONA

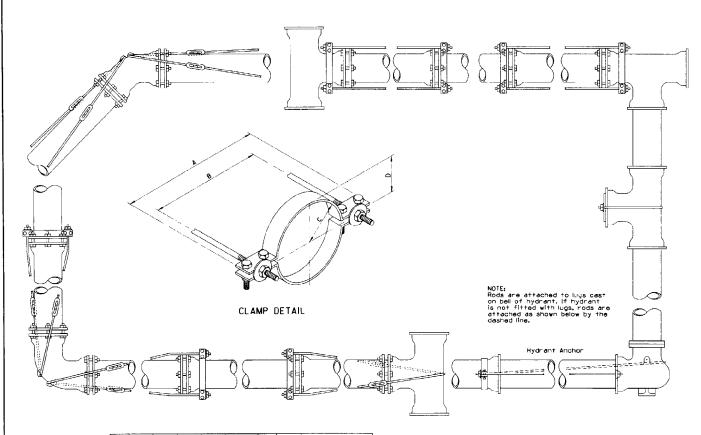
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

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DIVISION OF HIGHWAYS
STANDARD DRAWINGS

UNIVERSAL NO.

JOINT RESTRAINT WITH THE RODS
C-23.40





PIPE		_			0, 11,0	200	DOL TO	WASH	.RS	
SIZE	A	В	С	D	CLAMP	CLAMP ROD	ROD BOLTS	CAST IRON	STEEL	
4-	121/2.	101/8.	21/2.	13/4"	1/2"×2"	3/4.	%.	%·×3°	/2'×3'	
6.	14 1/2'	121/8	3%	211/16	½"×2"	y4.	%.	%'×3'	1/5.×3.	
8.	163/4	143/8"	42/2	37/2	%.×2/2.	¥4.	5%⋅	%'×3'	<i>y</i> ₂·×3·	
10*	191/16	16"/6"	54	5-	1/8 ×2 1/2	%∙	3/4-	%'×3"	<i>y</i> ₂'×3'	
12*	221/16"	19⅓6"	6¾.	5%	%:×3.	%∙	7/8⁻	74 ×31/2	Y2"×3/2"	

- This detail is for use only on underground installations where the use of concrete thrust blocking per Std C-23.10 cannot be used because of obstructions, or requirements of the specifications.
- 2. Washers may be cast iron or steel, and may be round or square. Holes shall be $V_{\rm B}$ inch larger than the rods.
- 3. All the rods, rod couplings, turnbuckles, boths and nuts for these joints shall be of cerbon steel equivelant to ASTM A-307, grade B, with cadmium plating in accordance with ASTM A-165, except that the minimum thickness of the plating shall be .0002 of an inch. Cadmium plated boths shall have class 2A threads and the nuts, rod couplings and turnbuckles shall have 2 B threads.
- 4. High strength, heat treated cast iron tee-head boits with hexagon nuts, all in accordance with the strength requirements of AWWA C-III, may be used in ileu of the cadmium plated boits and nuts.
- 5. The sketches in this series of figures show acceptable methods of providing anchorage. There is no particular significance to be attached to whether the sketch shows a bell and solgot joint or a standard mechanical joint. The anchoring procedure illustrated abplies in most cases to either type of joint, in some cases, dimensions of the particular joint will influence the choice of methods used.
- 6. In certain assemblies of rod and clamps shown, rods run from a lug on the fitting for a clamp behind the hub of a bell) to a clamp against a face of a bell. Note that this arrengement anchors only one joint. The stability of the joint where the clamp is against the face of the bell depends on having soil above a relatively long piece of pipe on both sides of the joint. Consequently, if the distance between the first and the second joint is less than 12 fact, the second joint shown shall be anchored by a clamp behind the hub of the bell and rods to a clamp at the face of the next bell.
- For pipe larger than 12 inch diameter, restraint details shall be submitted for approval prior to installation.
- All exposed metal shall be coated with asphaltic primer per subsection 907-2.02.
- 9. Bolt holes in clamps shall be ${\backslash\!\!\!/}_{16}$ inch larger than the bolts.

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APPROVED FOR

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

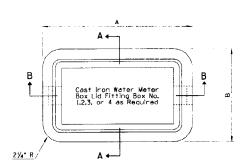
STANDARD DRAWINGS

JOINT RESTRAINT WITH TIE RODS

C-23.40

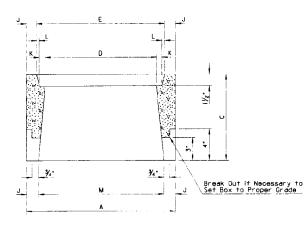
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PLAN

SECTION B-B



SECTION A-A

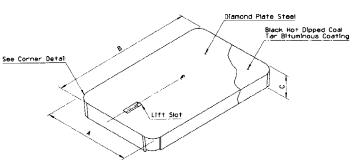
- The meter boxes shall conform to the dimensions as shown and shall be made of portland dement concrete poured and tamped (or vibrated) in true forms.
- 2. Use Class 5 concrete, fc:4000 psi.

METER BOX DIMENSIONS								
BOX NUMBER								
DIM.	1	2	3	4				
A	19*	24 1/2"	29/2	33/2"				
В	12"	1634	181/2	223/4"				
С	11*	12*	13*	12*				
0	14*	19*	23¾.	2774				
Ε	16*	22*	26/2	30½°				
F	9.	131/4"	15"	193/4"				
G	7*	111/4"	12 1/4"	17*				
н	9.	141/4"	15 1/2	19₹4*				
ı	6.	8%	91/4"	113/8				
J	11/2"	13/4"	13/4*	13.				
K	3/4.	11/8-	1-	1-				
L	/ ₄ ·	%⁻	%.	3/6"				
M	16*	21*	25 / ₂	30/2*				
N	21/2.	31/2"	4"	4*				
	% OR ¾ METER	1" METER	ι/⁄2" METER	2" METER				

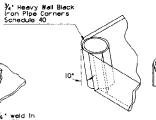
DESIGN APPROVED LEWY H. Otterne. APPROVED FOR	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/94
Consequentles,	(1) CONCRETE WATER METER BOX	C-23.45



1. All steel per section 1004-1 and 1004-2.







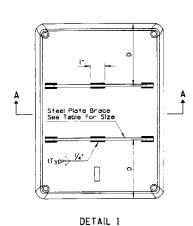


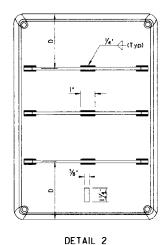
PERSPECTIVE

CORNER DETAIL



SECTION A-A



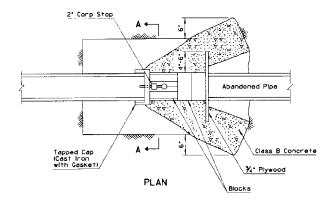


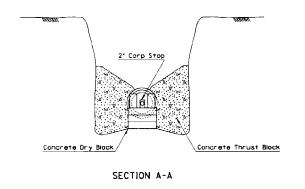
ю	A	В	С	D	STEEL PLAT	BRACE	WEIGHT	MATERIAL
1	9,	151/8"	13/8	None	None	None	5% Lbs	14 Gauge
2	141/8	213/4"	11/2.	61/2	% ×1/4 ×13/8	Detail 1	123/4 Lbs	12 Gauge
3	151/4"	261/4"	11/2"	81/4"	% '×! /4 '×14 /4'	Detail 1	191/4 Lbs	12 Gauge
4	19 1/2"	30*	11/2	71/a*	3/6 'x1 1/4"×18 3/4"	Detail 2	33 Lbs	li Gauge

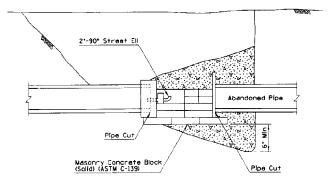
SPECIFICATIONS

DESIGN APPROVED LUMH, Ottoman ARREGUED FOR	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	7/94
and culling	STEEL COVER FOR WATER METER BOX	C-23.50







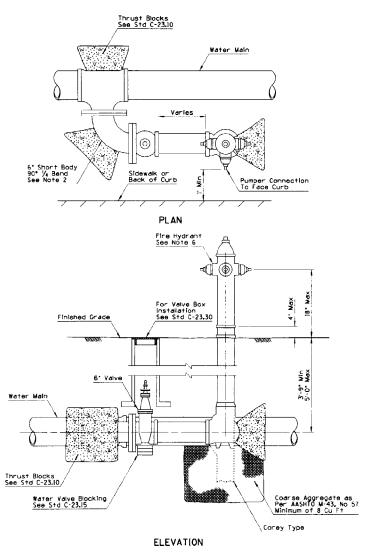


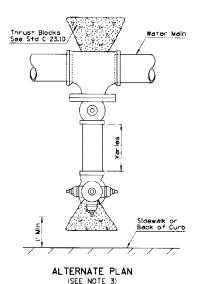
ELEVATION

- 1. Cut and plugs must be adequately 'dry blocked'.
- Dry blocks shall be standard size solid masonry concrete blocks. (ASTM C-139).
- The quantity and arrangement of the blocking must withstand the line pressure by holding the cap or plug in position.
- () 4. Concrete thrust blocks shall not be poured untill line pressure is restored and the cap or plug is inspected for leakage.
 - Concrete shall not be poured over any portion of the abandoned pipe.
 - 6. Minimum thrust block area per Std C-23.10.
 - Where a 4° or larger line is specified to be abandoned, the cut and plug should occur at the supply line main to avoid creating an unused deadend line.







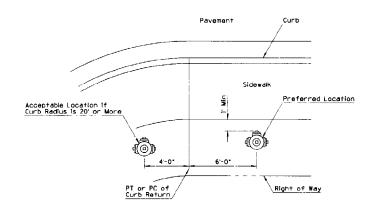


- All joints in hydrant run-out to be mechanical joints.
- Hydrant Tee: Clow or approved equal may be used in place of Tee and 90° bend.
- 90° bend not required if sufficient room for perpendicular installation.
- 4. See Std C-23.10 and C-23.15 for concrete thrust blocks
- A flange by mechanical joint shutoff valve, connecting directly to the Tee or below at the main shall be used.
- Fire hydrant, fire hydrant threads, valve and valve boxes per municipality requirements,

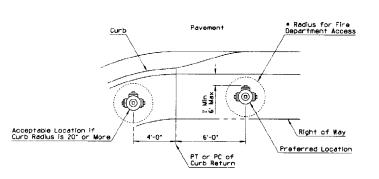


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- Obstructions such as utility poles, street signs, irrigation boxes, fences, etc., must not be placed between curb and hydrant.
- 2. Radius varies by municipality.
- 3. Dimensions shown on plans supersede locations shown on this detail.
- On locations in midblock, the fire hydrant will be aligned with a property line.



AREA WITH SIDEWALK



PARKWAY AREA OR NO SIDEWALK

(DESIGN APPROVED LEWY H. Otterwich APPROVED FOR	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		7/94
pould to bein		TIRE HYDRANT LOCATIONS	C	но. -23 . 65